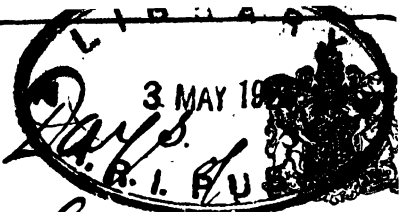




**AGRICULTURAL RESEARCH INSTITUTE**  
**PUSA**







*Crewe*

BY  
APPOINTMENT  
TO H.M.  
THE KING.

## Animal Medicines



### DAYS' BLACK DRINK

The Original and only Genuine—Beware of Imitations  
It is impossible to over estimate the value of this magnificent  
remedy. An unfailing stimulant and tuck me up. Promptly  
cures Colic or Gripes, and Chills in Horses and Cattle. In-  
stantly relieves Blown Cattle. An unequalled remedy for  
Scour in young or old stock. Should always be at hand  
during Calving, Lambing, Foaling. It saves life.

### DAYS' RED DRINK.

The Great Cattle Medicine. It prepares the Cow for Calving, prevents Milk Fever,  
Inflammation, or Udder Troubles, Cleanses the Cow after Calving. For all Digestive  
Troubles and General Unthriftiness. It is the Dairy Farmer's Sheet Anchor. In Large  
Containers with dose measure.



### DAYS' ZOMO-SAL.

The finest Saline Condition Powder known.  
For Old Appetite and Unthriftiness, Humour,  
Blisters, Blood Disorders, Indigestion. It is  
no equal for preparing Show or Sale Animals.  
It never disappoints.



### DAYS' OILS.

Days Purified Drimfield  
Oils. The perfect Calving  
and Lambing Oil. In-  
tensely soothing and



healing. An indispensable dressing for all Wounds, Cuts, Broken  
Knees and for Sore Teats and Swollen Udders.

Days' White Oils. For all Sprains, Sore Throats, Relieved  
Tendons, and all the purposes of a general rubrication.



### DAYS' HUSKOLEIN.

For all Internal, Parasitic Disorders, Tapeworm in all animals, the  
finest treatment for Hush or Hoose in young or old stock. A splendid  
Tonic and Worm Drench for Lambs and Calves—results being out of  
all proportion to the small cost of the medicine.



### THE "UNIVERSAL" MEDICINE CHESTS.

Enormously popular. Thousands in regular use. The acme of conven-  
ience. Arranged in any way to suit patrons. For Calving, for Lambing,  
for Cattle, for Horses for all combined, or in any combination.



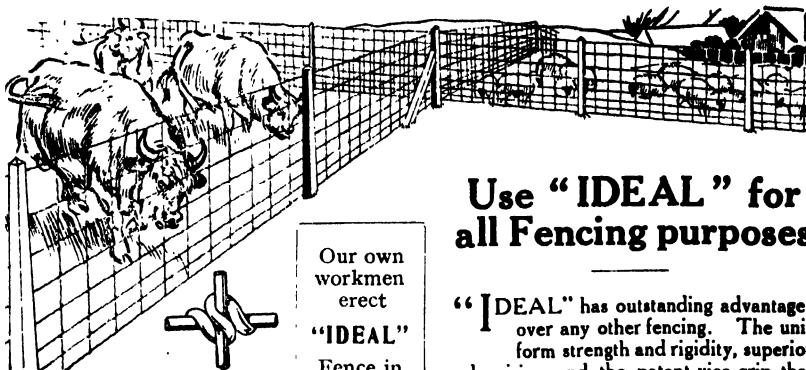
PRICE LISTS FREE

POST ORDERS RECEIVE PROMPT ATTENTION

ONLY ADDRESS—

DAY & SONS CREWE LTD CREWE





THE "IDEAL" LOCK.

# IDEAL WOVEN WIRE FENCE

Our own  
workmen  
erect

"IDEAL"

Fence in  
any part  
of Great  
Britain.

Use "IDEAL" for  
all Fencing purposes

"IDEAL" has outstanding advantages over any other fencing. The uniform strength and rigidity, superior galvanising, and the patent vice grip that locks the wires mean years of satisfactory service that cannot be obtained from an inferior and cheaper make. It's the FENCE WITHOUT A FAULT, THE FENCE THAT COSTS NOTHING TO MAINTAIN which is cheapest really, THAT FENCE IS "IDEAL."

Fully illustrated catalogue (L) and prices will be sent post free.

**H. L. GOODMAN & SON,** 24, Lime St., LONDON  
19, Clare St., BRISTOL

## THE NATIONAL INSTITUTE for RESEARCH IN DAIRYING



*University College, Reading.*

**£150.000**

Urgently required to clear the new farm from debt, and extend the laboratories to meet increased demands.

Please send donation or enrol as: Fellow at £5 5s. 0d. per annum.  
Member at £1 1s 0d. " " "

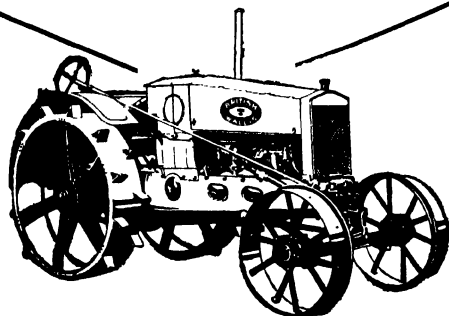
The Secretary,

**The National Institute for Research in Dairying,**

PREMIER HOUSE,

150, Southampton Row, London, W.C.1.

# The **BRITISH WALLIS** BRITAIN'S FOREMOST **TRACTOR**



## *The Tractor of Proved Merit.*

**How's this for the last word in efficiency ?**

At the International Tractor Trials held at Lincoln in Oct., 1920, the British Wallis Tractor was awarded by the Royal Agricultural Society of England

**FIRST** { **IN THE**  
**PRIZE** { **THREE**  
**FURROW**  
**CLASS** } **GOLD**  
**MEDAL**

That's the grade of efficiency you want on *your* farm. - - - - There is one way to attain it.

**Present Delivery 7 days from Date of Order.**

**Manufactured by RUSTON & HORNSBY, Ltd., LINCOLN.**

78-82,  
Brompton Road,  
LONDON,  
S.W.3.



Telephone--  
KENSINGTON,  
4260 (3 lines).  
Telegrams -  
"GEEMOTRUK,  
KNIGHTS,  
LONDON."

*Managing Director : W. TURNER SMITH.*

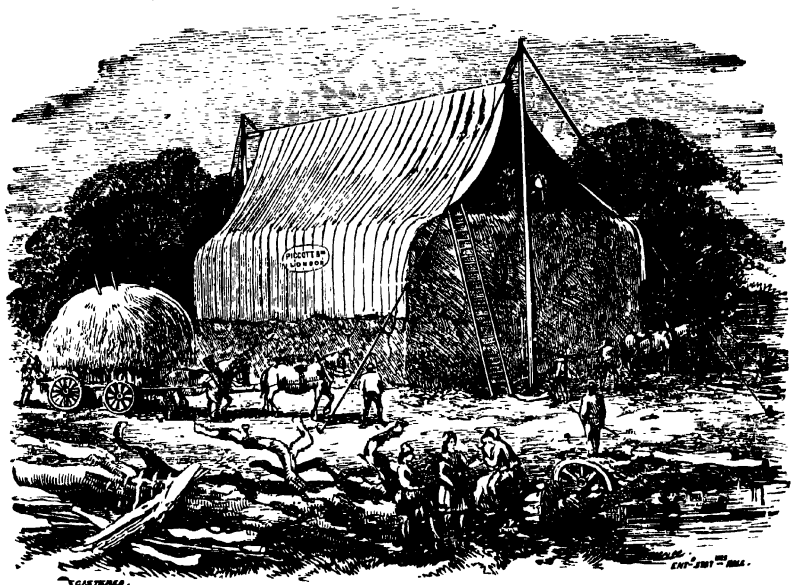
Address—"Piggott, London." A B C Code (5th Edition).

Telephone—London Wall 4850 (4 lines.)

# PIGGOTT BROS. & Co., Ltd.

## RICK CLOTHS.

Contractors for upwards of Sixty Years to the Bath & West & Southern Counties Society.



Size.

8	6 yards for 10 loads
8	8
10	8
10	10
12	10
12	12
12	13
14	13

A set of Lines and Pulleys for the first four sizes  
A set of Lines and Pulleys for the last four sizes  
A set of Poles for the first four sizes  
A set of Poles for the last four sizes

Flax Canvas. Cotton & Hemp Canvas. Tarpaulin Canvas

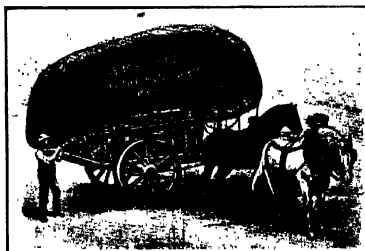
Natural Colour or Green Proofed.

From 3/- to 6/6.  
per square yard.

Samples on Application.

Price  
per set  
on  
application

**Piggott's  
Tarpaulins,  
Wagon  
Covers,**



**and  
Waterproof  
Canvas  
Sheets.**

All fitted with strengthening patches, eyelets and best hemp lines. Lettering Tarpaulin and Wagon Sheets, extra.

SIZES USUALLY STOCKED.

6 x 6 12 x 6 15 x 6 15 x 12 18 x 12 21 x 12 21 x 15 24 x 18

In Black-dressed Canvas, Khaki or Green-proofed, from 3/- to 6/- per square yard.

**220, 222, 224 & 226, BISHOPSGATE, LONDON, E.C.**



## PRIZE CUPS & BOWLS.

THE Goldsmiths and Silversmiths Company will be pleased to send post free a copy of their illustrated list of Cups, Bowls and Trophies suitable as prizes for all occasions.

THE  
GOLDSMITHS & SILVERSMITHS  
COMPANY LTD with which is incorporated  
the Goldsmiths' Association Ltd Est<sup>d</sup> 1751

ONLY ADDRESS, NO BRANCHES

112 Regent Street London, W.1.



JOURNAL  
OF THE  
BATH AND WEST AND SOUTHERN COUNTIES  
SOCIETY.

*In answer to a request  
for “The Very Best”*

Agents, Traders and others will find the following list invaluable when asked to recommend oils and motor spirits of superlative quality.

**“B.P.” Motor Spirit**  
for every car, climate and service.

**“T.V.O.” Tractor  
Vapourising Oil,**  
minimum cost Tractor Oil of  
low consumption and high power.

PURVEYORS OF  
MOTOR SPIRIT



BY  
APPOINTMENT

**“P.V.O.” Vapourising Oil**  
the Ideal Fuel for Oil Engines.

**“White May” Finest  
Water White Lamp Oil**  
specially recommended for incu-  
bators.

**BRITISH PETROLEUM Co., Ltd.**

**BRISTOL: ST. JAMES BUILDINGS,  
UNION STREET, BRISTOL.**

**LONDON: Head Office:**

**22, Fenchurch St., London, E.C.3.**

Numerous depots in every country.

**JOURNAL**  
OF THE  
**BATH AND WEST AND SOUTHERN  
COUNTIES SOCIETY**

FOR THE  
ENCOURAGEMENT OF  
AGRICULTURE, ARTS, MANUFACTURES AND COMMERCE.

-----  
ESTABLISHED 1777.  
-----

**FIFTH SERIES.**

**VOL. XV.**

1920-1921.

-----  
**WORK AND LEARN.**  
-----

LONDON :  
EDWARD STANFORD, LD., 12 TO 14, LONG ACRE, W.C.2.

1921.

*[All rights reserved.]*

*Price to Non-Members Six Shillings and Ninepence.*



**" He that goes about to forward agricultural improvement must begin by finding out the true reason of what is called routine, or ' the custom of the country.' It sometimes happens that these reasons are only accidental, and then you may dismiss them fearlessly ; but often it turns out that every-day practice rests on a solid foundation of facts ; and then if you make an onslaught on local prejudices, they will be sure to beat you."**

**" The true course for the agricultural improver is, to take one step at a time, to gain a clear insight into facts by experience, not to try to go too fast, and to trust to the work of time."**

**" If practice which sets up to do without theory is contemptible, theory without practice is foolhardy and perfectly useless."—From the *Rural Economy of England, Scotland and Ireland*, by LEONCE DE LAVERGNE.**

*Journal communications should be addressed to the Editor,  
3, Pierrepont Street, Bath.*

# CONTENTS.

## VOLUME XV.—FIFTH SERIES. 1920-1921.

### ORIGINAL ARTICLES AND REPORTS.

	PAGE
I. The Land and the People .. .. . By <b>Sir Herbert Matthews.</b>	1
II. Treatment of Waste from Milk Factories .. .. . By <b>A. F. Somerville.</b>	17
III. Milk Recording .. .. . By <b>Harold Jackson.</b>	25
IV. Vegetable Galls .. .. . By <b>Harold Bastin.</b>	30
V. The Forest of Dean .. .. . By <b>The Right Hon. F. D. Acland.</b>	56
VI. Modern Developments in Farm Tractors... .. . By <b>H. E. Garner.</b>	62
VII. The Society's Exhibition at Salisbury .. .. . By <b>W. A. Smith, Assistant Secretary.</b>	73
VIII. The Dairy Department at Salisbury .. .. . By <b>A. F. Somerville.</b>	80
IX. The Milk Test Classes at Salisbury .. .. . By <b>Dr. J. A. Voelcker, M.A.</b>	85
X. The Forestry Section at Salisbury .. .. . By <b>G. Lipscomb.</b>	90
XI. The Nature Study Section at Salisbury .. .. . By <b>H. M. Cundall, I.S.O.</b>	93
XII. The Exhibition of Cider at Salisbury .. .. . By <b>Major E. W. Farwell.</b>	95
XIII. The Dairy Herd Competition at Salisbury .. .. .	97
XIV. Annual Report upon the Society's General Operations .. .. . By <b>F. H. Storr, Secretary.</b>	99
XV. The National Fruit and Cider Institute .. .. . By <b>B. T. P. Barker, Director.</b>	104
XVI. Report of the Society's Consulting Chemist .. .. . <b>(Dr. J. A. Voelcker, M.A., F.I.C.).</b>	199

## APPENDIX.

## SALISBURY MEETING, 1920.

Judges and Awards .. .. .	i-ii
Awards .. .. .	iii-lxxxviii

## PRIVILEGES, LAWS, OFFICERS, ETC.

Objects of the Society and Privileges of Membership ..	lxxxix
Terms of Membership .. .. .	xc
General Laws .. .. .	xc-i-xciii
Council and Officers .. .. .	xciv-xcix

List of Annual Exhibitions, 1852-1921 .. .. .	c-cii
Privileges of Analysis .. .. .	ciii-cvi

## BRISTOL MEETING, 1921.

Donors of Money Prizes .. .. .	cvii-cviii
Judges and Prizes for Stock, Produce, etc. .. .. .	cix-cxxix
Conditions and Regulations for ditto .. .. .	cxx-x-cxl
Judges and Prizes for Poultry .. .. .	cxli-cxliii
Conditions and Regulations for ditto .. .. .	cxliv-cxlv

## FINANCE.

Summary of Cash Account to December 31st, 1920 ..	cxlviii-cxlix
Annual Cash Account .. .. .	cl-clix
Assets and Liability Account .. .. .	clx
Financial Result of Show .. .. .	clxi

List of Members .. .. .	cxii-cxc
INDEX .. .. .	cxci

# *ILLUSTRATIONS.*

<i>Plates I -IV</i> (BASTIN)	...	.	<i>following page</i>	32
<i>Plates I -II</i> (GARNER)	...	...	„	„ 64
<i>Salisbury Stock</i>	...	...	„	„ 72
<i>National Fruit and Cider Institute</i>	...		„	„ 136 & 19



JOURNAL  
OF THE  
BATH AND WEST AND SOUTHERN COUNTIES  
SOCIETY.

**Original Articles and Reports.**

1.—THE LAND AND THE PEOPLE.

*By Sir Herbert Matthews.*

The passion to acquire and occupy land is one of the dominating facts of history in all ages and among all peoples. Wars have been fought to obtain possession of a country; wealthy estates impoverished by legal battles; political jobbery and legal chicanery have been employed in attempting to eject occupants or to retain possession of doubtful ownerships.

In the case of nations victory has always gone to the strong; the original inhabitants had no rights if an aggressor proved more powerful than the occupier. If a ruler was of war-like temperament he fought for love of fighting, until, like Alexander, he sighed for further worlds to conquer. More often wars of aggression have been due to need. A race made lazy and peaceful by the very fact that they occupied a fruitful territory were bound, sooner or later, to become the victims of a neighbouring tribe whose conditions of life were harder and whose hardier lives rendered them more doughty warriors. The world has nowhere offered fixity or security of tenure to its tenants, save where they made their own security by being armed and ready for the foe. The laws of life make such a rule inevitable. Perfect security in course of time always saps the energy of a man or nation. Constant watchfulness keeps a man or a nation alert and progressive. To live by the land means an

enormous and continuous expenditure of energy, constant watchfulness against attacks from many different kinds of foes, and, in this climate, a never-ending anxiety about the weather. Yet, in spite of all its trials there is a deeply-rooted instinct in most men's minds which calls them to the land. It is always there, though if it be not roused by opportunity it may remain latent throughout life. With some the call is so insistent that no matter what their early environment, they must at all costs obey it, and throwing aside all ties and customs break away to the open country. This instinct is sentimental, and however insistent such a call may be it by no means follows that it is due to any genius for cultivation. In fact the reverse is very often the case.

These are factors which have to be recognised, whether the apostles of new and fanciful political creeds like them or not.

Mr. Radford will not agree. In his book, "*The State as Farmer*," he says (p. 139) :—

"The magic of property is simply and solely the magic of pride. To the real workers on the land the fact that they used not to be burdened with this magic has a more heavenly sound."

That is an interesting expression of his personal opinion, but can he give any instances of real workers on the land finding "a more heavenly sound" in any other form of tenure than ownership? Can he give a single example of equally good work and equal energy being put into a co-operative or communistic undertaking as—let us say—the average French peasant puts into his small farm?

I hold no brief for the present landowners, and I think it quite probable that the existing system of land tenure can be improved upon. My desire is to further the methods which will produce the best results for the nation; such "best results" being the greatest possible production of home-grown food, and the remunerative employment of the largest number of people in rural localities. If it can be shown that nationalised land can do this than I will plump for nationalised land. It is up to the advocates of this theory, however, to prove that their method, which at present is purely hypothetical, will do better than the system we know.

When war broke out on the 4th August, 1914, the problem of food supply was the subject of the very gravest anxiety to everyone holding any important official position. The general public never knew of this anxiety; a part of the Press had some inkling of it, but wisely refrained from publishing what might have caused a panic; but the immense relief to these same officials, when the Board of Agriculture issued a statement through the Press that the

new harvest just then being gathered in, represented five months' food supply, in addition to such imports as were then *en route* to this country, will never be fully realised.

Five months' supply ! Oh, well, thought the man (and woman) in the street, the war will be over by then, so we needn't worry about that ; and long before the five months was up every one was too much occupied with other matters for this problem to recur to their minds. Everyone, that is, except a few men in certain Government Departments, whose business it was to watch the food supply, and whose anxiety never lessened until the end of 1918. However, the statement issued by the Board of Agriculture prevented a panic, which was one of the dangers of the situation.

In 1905 the Royal Commission on Food Supply in Time of War went very fully into this matter. and though they did not dwell upon it in their conclusions, the body of their report showed that the Commission fully realised the grave danger of a sudden panic owing to inadequate supplies. If Germany had declared war between February and the end of June no such statement could have been issued by the Board of Agriculture, and the food supply would have changed the whole course of the war.

It is a very remarkable fact that just after a whole generation of the most serious depression in agricultural history, the home industry was able to feed 45 millions of people for five months. This was due, almost entirely to the generosity and philanthropic spirit shown by British landowners during the depression. For a whole generation our people had been obtaining the staple articles of food below the cost of production, and this was only rendered possible because landowners, as a class, had received no interest on their investments in land, and but a paltry return (possibly 2%) on the cost of equipment which enabled the land to be farmed. It is true that the best land could always be worked at a profit and a fair return received from it, but average and poor land paid next to nothing, and was for years kept under cultivation at an absolute loss. This loss was first felt by the cultivator, but if he was a tenant this loss - or most of it - was passed on to the landowner, who would have been financially wise to let all but the best land go out of cultivation altogether. They were financially unwise, but patriotic, and so in August, 1914, the Board of Agriculture were profoundly glad to be able to announce this wonderful five months' supply.

With this fact to its credit, and it is a fact, very strong arguments will be needed to induce the country to displace the present system of land tenure by some unknown scheme, of dubious advantage to



anyone except needy persons hunting for places under a bureaucratic monopoly.

We have among us, however, a school of theorists who demand the Nationalisation of Land. It is extremely difficult to deal with their theories because there is a variety of them, and they do not harmonise with each other : their phraseology is vague and loose, they use expressions differently to ordinary people, and they apply their own meaning to words and so confuse the average man.

This is not an unusual method of endeavouring to obtain adherents to a cause. It is easy for the word-monger to string together sounding phrases which will carry an audience to the point of passing terrific resolutions. It is easy to convince a neophyte of any economic fallacy, if he does not trouble to listen to the other side. It is an advantage, by the judicious use of indefinite terms, to be able to say when challenged, that the speaker meant something different to the obvious interpretation put upon them by a listener. It is easy to point to all the drawbacks or inequity which may lie in an existing system, and to urge that all these disadvantages will be removed if some quack nostrum be substituted. If to these methods be added deliberate attempts to arouse class passion by making untrue statements, or by putting a wrong construction upon facts, it can be seen that the advocates of the wildest theory have certain advantages in their favour.

As an instance of deliberate stirring up of class passion by misrepresentation let us turn to pp. 131-2 of "The State as Farmer"—

"The owner of the deer forest or park is the very first to scream for conscription when war comes. He makes desolate the region where the thews and sinews, hardihood and valour flourish, then coolly asks the State to save him by taking men by force from other places whither they have been driven by his disastrous feudal powers.

"Just look fixedly at what the landowner has wanted all these years. He wanted a duty on corn so that, without improving the yield, he might put a heavier price upon the citizen's loaf and extract a higher rent for himself."

As regards the first of these paragraphs, the war must have shown every one but the most prejudiced that the landowning class were as much to the front as any other section of the community in filling positions of danger, and as regards the second paragraph it may safely be said that half the land in this country is owned by men who have consistantly opposed a duty on corn.

As an example of vagueness let us quote from an article in the *British Farmer* for 25th September, 1920, p. 824 :—

“ How ‘ Land Nationalisation ’ can best be secured need not worry us for the moment. Let us first decide that we will carry through this most important measure, and ways will be found how to do it. One word only need be said about method. We can rest assured we shall secure our aims by much cleaner and better methods morally than the records of history show us much of what is now private property in land has been secured to those who hold it.”

This is typical of these communists, but would the writer of this paragraph invest even a fraction of his money on the strength of a prospectus which told him that he “ need not worry ” how dividends were to be earned ; the only thing that mattered being to raise the money needed by the promoters to start the company. If he did invest on such proposals we may envy his trust in human nature, but we would not follow his advice. Yet this is not a question of investing a few hundreds or thousands of pounds, but of risking the life of an industry which produced over 200 million pounds worth of food per annum,\* provides occupation for over a million people, and saved the country at the most critical juncture in its history by supplying food for five months. All this is to be hazarded in order to gratify the curiosity of a few cranks who tell us not to worry how it will happen, but to take the profession of food-production out of the hands of those who know their business and to place it under the control of a Government Department.

One would get more excitement with less risk by indulging in the three-card trick on Epsom racecourse.

Difficult as it is in the face of such arguments let us endeavour to summarise the theories of the Nationalisers. They may be roughly divided into three, or four, groups.

- (a). Those who advocate the expropriation of landowners, but with compensation for the loss of property. The Land Nationalisation Society and the Fabian Society are the leaders of this group.
- (b) Those who would take the land without any compensation and who generally recommend its acquisition by varying

\* Pre-War and in Pre-War values. Vide “ Our Food Supply,” by Christopher Turnor. 1916.

methods of taxation. These latter usually claim that they only desire to tax the *unimproved* value of land, *i.e.*, to tax it on its prairie value.

It should be noted, however, that generally those in Class (b) only consider buildings as improvements, and ignore all the expenditure incurred in clearing, draining, fencing, road-making, and cultivation of agricultural land. Thus it is evident that they do not know the meaning of "prairie" value, or they are wilfully misusing the term. Class (a) are "Land Nationalisers," Class (b) are "Land Taxers."

The leaders of Class (b) take their views from Henry George's "Progress and Poverty" published about 1879 :—

"I do not propose either to purchase or to confiscate private property in land. The first would be unjust; the second, needless. Let the individuals who now hold it still retain, if they want to, possession of what they call *their* land. Let them buy and sell, and bequeath and devise it. We may safely leave them the shell, if we take the kernel.

"Now, insomuch as the taxation of rent, or land values must necessarily be increased just as we abolish other taxes, we may put the proposition into practical form by proposing—To abolish all taxation save upon land values."

That sets forth in unequivocal terms the author's views, and so far as anyone calling himself a follower of Henry George is concerned we know where they stand. They do not wish to rob landowners of their land, but they do wish to rob him of its value. At least they are candid.

(c) A group which may consist in part of members of (a) and (b), as well as those otherwise unclassified, who demand "fixity of tenure." Some of these realise that this method offers an indirect attack, less obvious than the frontal attack carried on by (a) and (b), and it may to that extent be more dangerous. Some of this group with even greater subtlety prefer the euphemistic term "security of tenure" instead of "fixity of tenure," though, of course, many people use this latter term in complete ignorance of its mischievous parentage.

(d) Mr. Smillie—who wants not only to rob landowners, both large and small, of their property, but to fine them heavily for having owned it.

## THE LAND NATIONALISATION BILL.

Perhaps the most concise view of Group (a) is embodied in the draft Land Nationalisation Bill issued as Tract No. 4 by the Land Nationalisation Society. It proposes that all land shall become inalienable national property, under a Ministry of National Lands, with whom shall be associated an Advisory Council of ten members nominated by various Public and Private Authorities. Clause 4 provides that the national land shall be administered by the following Local Authorities :—

- (a) The London County Council ;
- (b) The Councils of County Boroughs other than Metropolitan Boroughs ;
- (c) Urban District Councils ;
- (d) Rural District Councils ;

by means of special committees with power to co-opt members from outside to the extent of one-fourth of their own number.

In 1914 the number of local authorities included in the above four classes totalled 1,801. To render possible the co-operation of any outside members each committee must consist of at least four members : without including any co-opted members, therefore, we have an irreducible minimum of 7,204 members of Land Committees. With the co-option of only one to each committee we have a minimum of 9,005 members of such committees.

Now it is not without interest to note in this connection that in the Session of 1920 a Bill was introduced by Mr. Adamson, and others entitled the Local Authorities (Payment of Expenses) Bill, which sought to provide that members of local authorities and other public bodies shall receive travelling expenses and allowances in respect of personal expenses and time lost. In England and Wales there are already over 25,000 such authorities with their committees, and the Land Nationalisation Society proposes to add another 1,801 Land Committees to this number. The expenses of these 1,801 committees will form one of the charges upon land which the unhappy national tenants must pay for.

Security of tenure is dealt with as follows :—

*Clause 6.—Security of Tenure Qualified by Public Right of Resumption.*

“ Every tenant of public land shall enjoy security of tenure and freedom from disturbance so long as he fulfils the conditions of his lease or agreement, provided always that the

Public Land Committee shall have power to resume possession of the land, after giving due notice and paying compensation for the tenants' improvements, whenever it may decide that the general public advantage will be best served by such action being taken—as, for instance, if the tenant fails to cultivate the land properly, or if the land is required by the Public Land Committee for its own or any public purposes, or for the sub-division or amalgamation of holdings."

*Clause 7.—Prohibition of Sub-letting, but permission of Assignment and Bequest.*

"A tenant of public land may not sub-let his holding, but he may assign his lease to another, or he may bequeath it to a member of his family, subject to the Public Land Committee being satisfied as to the suitability of his proposed successor."

*Clause 8.—Periodical Revision of Rent.*

"The rent of each holding shall be subject to revision at the end of every seven years, according to such fluctuations (if any) in the value of land as are not due to improvements affected by the tenant."

In all their literature there is nothing Nationalisers protest against more than the disturbance of tenants. Naturally, therefore, one expects to find absolute security given to future tenants of the State. In a note to Clause 6 of their Bill its authors say :—

"It would be impossible to exaggerate the importance of security of tenure. Without it, one of the chief incentives to industry is lacking. It is the purpose of this Clause to give every State tenancy as nearly as possible the security which is now only enjoyed by freeholders."

When we come, however, to study the terms of these Clauses we find tenants are liable to disturbance directly they fail to farm in the way the Public Land Committee say they should farm, otherwise they will resume possession of the land. The Committee also have power to resume possession of the land if required by the Public Land Committee *for its own or any public purpose*, or for sub-division or amalgamation of holdings.

A tenant may not sub-let his holding, though he may assign his lease or bequeath it to a member of his family, subject to the Committee's approval of his proposed successor.

Last, but not least, every tenant will hold his land subject to a revision of rent every seven years. The authors of this Bill apparently do not realise that a revision of rent is technically a

disturbance, but apart from this, if they imagine that a tenant will or can farm to the best advantage, with the probability if he farms well of an increase in his rent at the end of the seven years' period, they have much to learn.

We have only to look at what happened in Ireland, when the creation of Land Courts was followed by a period of the worst farming in the history of this country ; when land was let down on purpose to bring about a reduction of rent ; a process which was going from bad to worse, until a remedy was found in the Purchase of Land Acts.

An unwholesome feature of these Clauses is the power vested in the Public Land Committees of imposing harsh terms of tenancy : they could prevent an applicant obtaining any land who was distasteful to them. If they disliked a potential tenant's political views they could refuse permission to bequeath his land, or could prevent his making a favourable assignation of his lease because the assignee held different religious opinions to his own. They could keep a man off the land altogether who had incurred their displeasure.

These are not imaginary grievances, but it was the actual experience in New Zealand when Land Nationalisation was tried and ultimately given up because of the scandal of this nature which became common.

Australia also has had its lesson. The Land Acts of 1861 of New South Wales produced a crop of troubles of the kind foreshadowed above. These have been brought to light in Mr. Frank Fox's recent book, "*Our English Land Muddle*," published by Thomas Nelson & Sons, which should be read by those who want facts, as it is written by a non-partisan.

Apparently the tenants under the Bill we are now considering will have even less security of tenure than is usually the case under private ownership.

In Tract No. 1, "*Profiteering in Land*," issued by the Land Nationalisation Society, p. 31, we find :—

"State tenants to enjoy the full security of tenure which is only obtainable now by the few who can afford to buy land. This security to be guaranteed as long as the rent is paid and the land properly used. Improvements made by tenants to be their own property."

This hardly accords with their Bill which is issued as Tract No. 4. Clause 10 of the Bill provides that the State shall acquire not only the land "but also the buildings and other improvements ; but

every tenant of such land shall have the right to buy them. . . . . The ownership of such buildings and improvements shall continue to be vested in the State until their purchase by the tenant has been completed, when they shall form part of the tenant right of each holding."

Unless one is well acquainted with the conditions of land tenure in this country it is difficult to realise the full import of this provision, but it is evident that the authors of this Bill wish the State to get rid of all the trouble of erecting and keeping in repair the necessary buildings and equipment of farms, and they hope to inveigle tenants into purchasing their farm buildings, after which tenants will have to keep them in repair. One would not expect many tenants to fall into this trap. The history of Irish agriculture hardly encourages tenants in this country to revert to the system that existed in Ireland through the early and middle periods of the nineteenth century.

Before leaving the consideration of this Bill, it should be said that its authors propose to compensate existing owners for all the land, including minerals in England, Scotland and Wales, but it does not extend to Ireland.

To turn to Class (b), Land Taxers. They endeavoured on many occasions to crystallise their views in the shape of Parliamentary Bills, and on two or three occasions succeeded in getting a good enough position in the ballot for Private Members' Bills to get a place for second reading. Thus Mr. Trevelyan, in 1902, introduced his Urban Site Value Rating Bill which was refused a 2% by a majority of 71 in a House of 387. In 1903 Dr. Macnamara introduced the Land Values Assessment and Rating Bill; this was also rejected on 2%. In 1904 Mr. Trevelyan introduced his Land Values Amendment and Rating Bill, which got a 2%, but was then dropped. Sir John Brunner introduced the same Bill in 1905, which also obtained a 2%, but proceeded no further. A Land Valuation Bill for Scotland, based on proposals made in a Private Bill promoted by the Glasgow Corporation in 1899, was read a first time in 1903 and 1904, but proceeded no further. The Land Values Taxation (Scotland) Bill was introduced and dropped in 1904, obtained a second reading by a majority of 20 in a House of 266 in 1905, and proceeded no further; but early in 1906, with a newly elected House the same Bill was read a second time with a majority of 319 to 61, a majority of 258. Those who remember the composition of that newly-elected House will recall this Division List not altogether without amusement. It was so very easy to stampede those new members of Parliament, full of

enthusiasm after eleven years of Opposition, into either lobby, in the early days of that Session; but this Bill was referred to a Select Committee who—notwithstanding the huge majority that sent it to them reported—in the calmer atmosphere of a Committee Room, its opinion—"That the Bill be not further proceeded with."

After this reverse the Land Taxers made no further important move in Parliament, but increased their energies in other directions, with the result that their hopes were raised to the highest level in 1909 by the Budget introduced by Mr. Lloyd George that Session. The prolonged struggle in Parliament on the resulting Finance Bill of that year is too recent to need recalling, but the persistent and determined resistance to the Land Taxers by a small minority against the massed ranks of the Liberal majority deserve recognition for all time. The terrible accuracy of the warnings given by that minority as to the result of these taxes, if persisted in, have been only too grievously realised ever since, by the shortage of houses which has become more marked every year since 1910 and by the feeling of insecurity among tenant farmers, which has become general throughout Great Britain.

After a ten years' test these taxes have been repealed by the Finance Bill of 1920, much to the sorrow and disgust of the Land Taxers, who, notwithstanding the bitter experience through which the country has gone owing to the imposition of their theories, are still just as keen on them, and just as determined to re-impose them as ever they were. Their aims are the same, but their arguments have to be presented in different forms. They repudiate the Increment Value Duty, the Undeveloped Land Duty, and the Reversion Duty of the Finance Act of 1909-10 as not being their scheme, and they wish the opponents of Nationalisation to forget the chorus of praise with which they welcomed those proposals in 1909, and the general support they gave to the Bill during its stormy passage through the House of Commons.

The next important historical fact was the Departmental Committee on Local Taxation appointed in 1911 to inquire into the changes which had taken place in the relations between Imperial and Local Taxation since the Report of the Royal Commission in 1901. The personnel of this Committee showed that the efforts of the Land Taxers had been rewarded, for it was rather heavily loaded with members holding their views. After two and a half years' work this Committee presented a valuable report treating in considerable detail the general problems of Local Taxation. The report of the majority included in their summary of conclusions and recommendations the following statement, from which the six



Land Taxing members of the Committee dissented in a Minority Report.

“ That the proposed substitution of a system of rating wholly upon the basis of land values for the present rating system is open to objection on the following grounds, and cannot be recommended :—

- (i) That the benefit derived by landowners (using the term in its broadest sense) from the general activity and expenditure of the community is not sufficient to justify the charge of the whole cost of local government, present and prospective, on this class.
- (ii) That a large part of this benefit is due to other causes than the activity and expenditure of the persons living in the local government area or areas in which the land is situated.
- (iii) That other classes of the community derive benefit from communal services, and that many of these would not contribute towards the cost of such services, either directly or indirectly, under the proposed basis of rating.
- (iv) That we are strongly of the opinion that the primary criterion to be taken into account in distributing the burden of local expenditure is that of “ ability to pay,” and that the present rating system conforms more nearly to this principle than that proposed.
- (v) That a system of rating upon land values would, we believe, tend to increased congestion of buildings.
- (vi) That the proposal, if adopted, to give the occupier the right of deducting the rate from his rent would dangerously reduce the number of ratepayers and would tend to deplorable results in local government.
- (vii) That the defects and equalities of the present system, *e.g.*, its defects in discouraging the improvements of rateable premises, are unduly emphasised by those who support the change, while it is doubtful whether the alternative system proposed would give rise to fewer defects and equalities.

This summary is, of course, somewhat bald without the context, but the Report itself devotes twelve full pages to discussing the theories urged in favour of the Rating of Land Values, and presents

most cogent reasons for the conclusions they summarise above. In fact, the Report\* as a whole will well repay perusal by those who wish to go more closely into this subject.

The issue of this Report was a further blow to Land Taxers, but so far from convincing them of their errors it only caused them to redouble their efforts in other directions, and by devious ways, some of them even posing as pacifists and pro-Germans during the War ; that being one method by which they hoped to upset existing forms of Government and administration. If one may attempt to summarise their present proposals it would be somewhat as follows :

- (a) Assessing local rates on Site Values on land other than improvements.
- (b) To enable Government and local authorities to purchase land and buildings at a price based on its rateable value.
- (c) To impose a special tax, anything from 1d. to 1s. in the £ annually, on the unimproved value of land and sites of buildings.
- (d) To abolish the law by which unoccupied land is free from rates.

(a) Is a complete reversal of the principle of taxing a man *annually* on his actual income, which has been in force since the reign of Queen Elizabeth. The old maxim of "ability to pay" is therefore to be scrapped. Its effect on the agricultural land of this country would be disastrous.

A definite sum has to be raised in the parish for public services. In many parishes there is an urban part and a rural part. The services referred to, at least the expensive ones, in England, are for the benefit of the urban part—sewers, street lighting, and so on.

If houses and improvements are relieved, a part of the expense must fall on other property, and this must be agricultural land.

(b) Under the present law the rates are assessed on an individual according to the income received from a property. For example—the site of a bank worth several thousand pounds ; old buildings having been pulled down in 1914 with a view to rebuilding—that operation was stopped by the War. The site was then let to allotment holders, who paid a few shillings. Under this proposal the site could have been taken compulsorily on the basis of the rent paid by the allotment holders—perhaps £30, whereas the company originally bought it for some thousands.

(c) A special tax. Land at present is subject to exactly the same duties as every other form of property.

If a man dies, his executors pay Estate Duty on the capital value of his stock and shares, factories, pictures, books, horses, and land and houses.

He pays income tax on his actual income—whether it be rent or interest or profit of trade or profession, or dividends from shares.

Land has for centuries been treated as a marketable commodity, like cotton, timber, wheat, and other goods. Why is one form of property to be thus singled out for special treatment. There is every reason against it, but let one suffice—it is the particular form of property which demands an annual expenditure to make and keep it re-productive. If it is to have any special treatment it should rather lie in the direction of reducing taxation upon it.

(d) The law that unoccupied property is not rated is a particular case of the general law. People do not keep valuable property unlet in order to escape rates. On the other hand, having regard to the fact that builders make new roads, sewers, etc., in developing estates, it has been of the greatest assistance to them that pending the realisation of a building estate they are not hampered by rates and taxes on vacant plots. It would necessarily contract these operations, and raise the cost of building, if builders had to find rates and taxes on vacant plots.

The “prairie value of land” means to them simply land unbuilt on. The fact that vast sums have been spent on reclaiming such land from bog, or from the sea, in clearing scrub and timber, in draining and so forth counts for nothing to them. The real prairie value of land is the market value of land in a perfectly wild and natural state, before any cash or energy has been expended upon it. The “free gifts of nature” about which they wax so eloquent do not exist outside their heated imagination, except in such modified forms and in such restricted quantities as to be hardly worth mentioning. We can admit blackberries and acorns, bilberries and beech-mast as free gifts of nature, but they do not suffice in a hard winter to maintain our average bird population. To assert that our cultivated crops are “free gifts” is a ridiculous mis-use of words. I challenge anyone professing to believe in these free gifts to try and live on an area of prairie land, of which there is still some to be found in Dorset, Devon, Staffordshire and Derbyshire, without the expenditure of both money and energy.

It is sometimes said with a certain amount of force that this question of Taxing Land Values resolves itself into two problems—Urban and Rural. It is, however, really more a question of degree

than two questions. The foregoing remarks have generally had the rural aspect in view rather than the urban, but it is often not possible clearly to distinguish the two. The following extract from an article by Mr. Harold Cox in "Nineteenth Century and After" is worth rescuing from oblivion as concise examples of the effect on Urban property if Land Taxers had their way :—

"Two men save £100 each out of their earnings. One buys Consols; the other buys a freehold ground rent. To put a special tax upon the purchaser of the ground rent which the purchaser of Consols is not asked to pay is partially to confiscate the property of landowners for the benefit of non-landowners. The particular attributes of land certainly do not justify this peculiar interpretation of the rules of equity.

"It is alleged that landowners do not bear their fair share of the national burdens, and on the surface the allegation is very plausible. In many of our large towns, houses are built upon building leases, and the freeholder receives a ground rent free of all rates and taxes except landlord's income-tax. It looks as if he escaped his share of municipal, if not of national, burdens. The answer is that a ground rent is the price paid for the use of land, and that in agreeing upon that price the two parties concerned necessarily take into account the burdens present and prospective upon the land. If the freeholder were made liable for part of the charges which might subsequently fall upon the occupier of the land, it is clear that he would want a higher price or ground rent, and it is also clear that the lessee would be willing to pay a higher price or ground rent because his own liability for rates would be reduced. In effect, the burden of the rates is discounted when the land is leased. It may be that in some cases the discount is not sufficient, and that the leaseholder finds that he has to pay higher rates than he anticipated; but the reverse case is quite as likely to happen. The main object of the freeholder is generally to create a fixed annuity which he can sell as a trust investment. For this purpose it is imperative that the ground rent should be relieved of the uncertainty attaching to local rates, and to secure this relief the freeholder will probably assent to a discount in excess of the real liability.

"During the term of the lease the lessee becomes in effect the owner of the land, subject to the ground rent which he has agreed to pay. He is assessed upon the full value of the land as well as upon the value of any buildings he may have

put upon it, and there is no reason to believe that assessors make a practice of under-valuing land and over-valuing buildings."

No attempt has been made in this article to introduce any new matter or arguments into this controversy. Rather it is an effort to re-state the case on plain and simple lines. There would be no need to labour it if a decision on Nationalisation or Taxation of Land Values could be left to an unprejudiced public—for the outstanding feature of the British character is a determination to see fair play. Unfortunately the public are not allowed to remain unprejudiced, but every possible mis-use of words is made in order to distort facts, to asperse individuals, and to mis-direct those unversed in economics. The subject is too vast to deal with in the scope of an article; one can only indicate the direction.

One last word—addressed to the general public in the capacity of consumer. If Nationalisation of the land comes about "your food will cost you more." If the method of Land Nationalisers be adopted the whole cost of maintaining an enormous bureaucracy, including thousands of government officials and many thousands of committeemen and their officials, must be added to the present cost of food production. If the Land Taxers' scheme be adopted and all taxes levied on owners or occupiers of land, then the whole burden of the country's taxation must be added to the cost of producing food, except that portion of the tax levied on the owners of such building sites, as are not concerned with the production and distribution of food. The addition of this burden would render production in this country impossible, unless terrific import duties were levied on competing products. If no such import duties were levied then consumers will be left entirely at the mercy of foreign trusts and monopolies, while gambling in the necessities of life will be much simplified for foreign gamblers and makers of "corners." If this outlook is not attractive to consumers they must remember that a large home production is the most effective weapon with which to fight foreign trusts and gamblers. Further, they must remember that the cost of food can never be reduced by increasing the taxes on land, as that is the producers' raw material.

---

## II.—TREATMENT OF WASTE FROM MILK FACTORIES.

*By A. F. Somerville.*

Amongst the many changes which, during the last forty years, have affected the industry of Agriculture, perhaps none is more striking than the change in dealing with milk by the dairy farmers. Landlords used to look with no favour on tenants who, instead of making cheese and butter, sold their milk to the milk distributors in our towns. It used to be said that in so doing, they robbed the land, by taking away all the produce of their cows, instead of returning to the soil the manure gained by feeding pigs with whey from the cheese, and young stock from the skimmed milk.

The Bath and West Society took a very active part, thirty years ago, in establishing schools for the making of cheese and butter, to encourage the individual farmer in the production of better cheese and butter made on the farms.

To-day, though the best cheese is still produced at farms, the bulk of it is made in the factory; butter has been almost replaced by margarine and is looked upon as a luxury, and the bulk of butter is either imported or made in the factory. A large proportion of milk is made into milk powder at factories, and whole milk for consumption is in the main collected and distributed by large central depots.

A good deal might be written, from the purely economic point of view, on the various causes which have led to this change, and also on the gain or loss thereby to producers and the public. It must be admitted that much can be advanced for a system which saves the producer a good deal of unnecessary cost for transport, a certain amount of annoyance, and gives him greater financial security, and which should at the same time assure to the consumer a more constant and reliable supply of dairy products.

The object of this article is not, however, to deal with the changes in dairy farming from the aspect of either gain or loss to the producer and consumer, but with a matter resulting from what I may call the factory system, which has been overlooked hitherto, has never been properly provided for and bids fair to become an intolerable nuisance and danger to communities living near these factories unless it be speedily and effectively dealt with.

When these factories were first established, in most instances on a small scale, the question of dealing with "waste" from their operations seems to have been regarded as a matter of no consequence. Where there were existing sewers, the factories

were allowed to connect up with them; where there were no sewers, the waste was poured, sometimes into road drains which connected with a stream eventually, in other places direct into a stream or river, and in some cases over land through which the waste percolated into adjoining wells.

In industrial districts, where the streams were already badly polluted, no doubt the extra pollution caused by a Milk or Cheese Factory would be considered to be a matter of no real consequence, but in rural districts, where streams were more or less free from serious contamination, and formed the water supply for cattle and for many domestic purposes, pollution by milk waste soon caused serious damage to farmers and the community generally. Where, too, wells were contaminated, the health of the community was endangered. Year by year this pollution has been increasing, until at the present time it has become such a very serious matter, that Local Authorities have at last been compelled to pay attention to it.

Proprietors of these Factories have certain obligations, under the Rivers Pollution Acts, which are clearly defined. In the case of industrial factories in existence before the passing of these Acts, effluents must not be discharged into streams unless reasonable and practically available means have been adopted for rendering them harmless; in the case of factories built after the passing of the Acts no such reservation exists with regard to "reasonable and practically available means."

It will be found that all Milk and Cream Factories, with hardly an exception, have been built since the passing of these Acts. That being so, the legal liability of these Factories to abate a pollution which is causing serious injury to the community is self-evident. Nor can it be said that to call upon the proprietors of these Factories to take proper steps for its abatement will be placing such a heavy burden of cost upon them as to seriously affect an important industry. No man has the right to inflict an injury on his neighbours so as to save himself cost or to thereby make an increased profit. In some cases this factory "waste" creates a new and direct pollution of a stream, in others it prevents the proper treatment of ordinary sewage with which it becomes mixed at sewage works.

There is, moreover, a further aspect of the case: a good deal of the waste contains valuable bye-products which can be recovered at a reasonable cost, and thereby waste of food products can be prevented. It can also be shewn that by proper treatment this part of the "waste" can, after recovery of bye-products, be rendered innocuous, and as to the rest of the "waste" that is merely a question of an addition to the working expenses to render it harmless.

The sources of pollution may be divided under three heads:—

- (1) Whey from cheese factories.
- (2) Tainted whole milk and separated milk from milk depots, creameries and butter factories.
- (3) Washings of floors and utensils from all factories dealing with milk.

1.—*Whey from Cheese Factories.* Unless the factory keeps a considerable number of pigs to consume the whey the latter has to be disposed of by sale to farmers in the district, and where the demand for whey is less than the supply, the surplus is discharged into drains. If the drains empty into a stream, fish are poisoned and the water rendered unfit for cattle to drink. If discharged crude into sewage works, unless the bulk is very small, the whey seriously interferes with the proper treatment of the rest of the sewage with disastrous results.

2.—*Tainted Milk and Separated Milk.* It frequently happens that considerable quantities of tainted milk are thrown away at milk depots, creameries and butter factories; and as regards separated milk the same remark as to the disposal of surplus whey applies also to surplus separated milk.

3.—*Washings.* In all milk depots and factories there is a considerable volume of weak sewage, from the washings of utensils and floors, containing milk, soap, and dirt mixed together. This, though not so virulent as (1) and (2), is still a serious source of pollution to streams, if discharged untreated into them, and materially affects the treatment of ordinary sewage at sewage works when discharged into public sewers.

Many instances of serious pollution resulting from the discharge into streams and public sewers, and also from percolation through the soil, could be mentioned, and I will give two which have come directly under my notice. A Milk Factory dealing with about 5500 gallons of milk a day, the bulk of which is converted into cheese, has been allowed to connect up its drains with the public sewers of a town of about 5000 inhabitants; the rest of the sewage of that town is practically domestic; the sewage of the town is carried to sewage works, where it is treated by filters and land irrigation.

Until the Factory was established, there was comparatively little difficulty in treating the sewage of the town. The Factory has increased its output at least fourfold during the last ten years, and



it has become practically impossible to deal with the sewage at the works, and serious pollution of an adjoining stream has resulted. Another Factory in the same district, dealing with a similar quantity of milk, has, besides creating an intolerable nuisance, polluted all the wells in its vicinity upon which the inhabitants have been dependent for their water supply. Complaints are constantly made, too, of direct pollution of streams; the fish have been killed and the water rendered unfit for the stock to drink, seriously reducing the value of the adjoining lands.

There is also another aspect of the case besides the harm done by pollution, and that is, that, both as regards this surplus milk and whey, valuable food products are being deliberately wasted, which might be recovered if proper steps were taken.

The production of milk powder by evaporation, and the recovery of milk sugar (Lactose) from whey have been carried on for some years successfully. The plant for the former can be installed at a cost which is not prohibitive; and, though the recovery of milk sugar entails a greater expense, this plant can be profitably installed in a factory where sufficient cheese is being made during the greater part of the year.

For some time past the attention of the Ministry of Health and the Board of Agriculture has been directed to the production of "Lactose," which is of great value as the foundation of many food preparations for infants and invalids, and in pre-War days the country was almost entirely dependent on importations from abroad for the supply of this most valuable food product. The machinery for its production is rather expensive, the smallest plant costing about £20,000, but given a sufficient bulk of whey for treatment, the bye product returns a good profit on the cost.

But even if such plants do entail an increase in the working expenses the public are entitled to demand that their interests shall be safeguarded even at the cost of a reduced dividend to the shareholders.

I am indebted to an eminent practical engineer for the following notes on the treatment of separated milk, the recovery of milk sugar, and the method of dealing with washings:—

"We may take the composition of Milk as regards the solids contained in it as:—

Total Solids	...	...	...	12 to 14%
Fats	...	...	...	3 to 4%
Casein	...	...	...	3 to 4%
Milk Sugar	...	...	...	3 to 4%
Ash. less than	...	...	...	1%

" *Skimmed Milk* is sometimes looked upon as a waste product at a Butter Factory or Creamery, where, after the separation of the fats, there is no outlet for the remnant milk ; the remedy for this is a plant for concentration by evaporation and the production of Milk Powder.

" *Whey*. The recovery of the sugar from the whey is possible by the evaporation of it to small bulk, followed by the crystallizing out of the sugar. The process is not easy of manipulation owing to the varying qualities of whey. Some contain more or less proteids, more or less fats not intercepted in the separation of the curd in the cheese making process, and most wheys are of acid re-action due to spontaneous lactic fermentation.

" It is therefore first neutralised by means of chalk or some other base, boiled, filtered from coagulated proteids, then evaporated, cleared of further proteids by means of alum, and the purified whey finally evaporated under vacuum, after which the sugar is allowed to crystallize out.

" A factory for this special purpose has been erected by the Dairy Branch of the Ministry of Agriculture, the Lactose Factory, Haslington, near Crewe. This building has been erected and is being equipped as a Demonstration Factory for dealing specially with whey, and later with other dairy wastes. It is designed for dealing thoroughly in every respect with a definite volume of whey, and it is the intention of the Directorate to stop the present deplorable waste, and incidentally to prevent the fouling of land, water and sewerage systems.

" It is probable that a higher price could be obtained for whey resulting from a careful manipulation of the cheese making operations, and consequently containing the minimum of fats and proteids ; and as the retention of these would add to the weight of cheese obtained the gain would be a double one.

" The refuse which will call for more serious consideration is that from the washing of floors, dairy utensils, churns, etc. It may be regarded as household sewage containing a considerable proportion of milk.

" Practical agriculturists know only too well of the great liability of milk to become sour—the basis of successful dairy management is the science and art of preventing lactic fermentation on the part of such organised ferments as the *Bacillus Acidi Lactici*, or any of the numerous other organisms capable of converting milk sugar into lactic acid.

" This lactic fermentation is accompanied by other butyric and alcoholic fermentations even under ordinary circumstances ; but

when soaps, general kitchen refuse and other nitrogenous adventitious matter are also present, and the whole mass is left to the mercy of the above, as well as to ever present putrefactive organisms, the result is a most nauseous and disagreeable product or conglomeration of products, solid, liquid, gaseous. If discharged into a stream, they are more deleterious than the usual manufacturer's waste effluents, such effluents as those from Paper Mills, Woollen Factories or Galvaniser's Works.

" Though the latter may be highly discoloured, and occasionally alkaline or acid in reaction, the colouring matter is small in actual mass, the weak acids are at once neutralised by the carbonates or bases in the bed of the stream, and the alkalies are carbonated by the carbonic acid naturally in the water, the water being no worse for the loss of it. But the nitrogenous or putrefactive content of these effluents is low, whereas, in the waste from milk factories it is high, as is also the case with brewery effluents.

" This putrefactive content has to be oxidised at the expense of the stream, and a stream denuded or robbed to any appreciable extent of its dissolved oxygen cannot support fish life, and when robbed even to a slight extent only supports it with liability to disease or abnormal development in the fish.

" At the same time the oxidation of organic matter under such circumstances as are now being considered results in the precipitation of slimy and solid products of disintegration, in the formation of colloidal bodies, which together with the increased and unnatural content, have an objectionable and inimical effect on the vegetation of the stream also, and the stream becomes ' dead.'

" The process of purification should therefore be undertaken in the factory before discharge. Even if not completed the actual purification ought to be properly started. By discharge into the stream, an improper and premature start is made in the process of purification, lactic fermentation is encouraged. This fermentation should be discouraged, and in the case of brewery waste it has been found that it can be arrested and displaced by a putrefactive fermentation which is the desirable start in the process of purifications. Following this, the process of natural oxidation by nitrifying bacteria can be put into operation either on filter beds, by irrigation over grass land, or even by dilution with very large volumes of oxygen laden water.

" In many cases, the milk content of the waste would probably justify a previous coagulation (by means of rennet) of the fats and casein, and the separation of these on filters of sawdust or straw for utilisation as cattle food; the resulting effluent from such

filters would then call for considerably less in the way of purification before discharge into the stream."

While the milk washings and other waste products incidental to the working of a milk factory are very objectionable and not easy to treat efficiently, a distinction must be made between these products and whey, since the latter is not only a far more objectionable product, but is also much more difficult to treat. Indeed no one up to the present seems to have been able to evolve a satisfactory method of treatment. A study of its chemical composition explains the chief source of the difficulty. It contains, as already mentioned, a high percentage of lactose. This substance, under the influence of the lactic acid bacteria always present, is fermented and considerable quantities of lactic, butyric and other acids are produced. Neutralisation of these acids with chalk, lime, or other base is merely a temporary expedient, since the liquid still contains considerable quantities of undecomposed lactose which, as soon as neutralisation occurs and a favourable medium is once more provided is again attacked by the lactic bacilli with a further production of acids. These acids prevent the purification processes, such as are used for ordinary sewage treatments, from operating so that these methods are comparatively useless. This cycle of changes will continue, however frequently neutralisation is effected, until all the lactose is fermented, a very long process, as the amount of this substance is so considerable.

This brief summary of the chemical changes which result explains the extreme difficulty of treating whey effectively by any of the methods (filter beds, land treatment, etc.), which are successful with sewage, and emphasises what has been stated above as to the paramount importance of dealing with whey, not as a waste product to be got rid of, but as a valuable food which must be conserved, and its utilisable lactose extracted. If whey is invariably dealt with in this manner and never treated as a waste product to be purified it will be found possible to deal with the washings and other waste products on the lines set out above or by other approved methods.

From what has been said it is clear that "waste" from Milk, Butter and Cheese Factories is a very serious cause of pollution; that valuable food bye-products are being wasted, and that "waste" should be treated at the factory itself before the effluent is discharged into a public drain or stream. Prevention is always better than cure, and it is certainly desirable to avoid proceedings by Local Authorities and individuals under the Rivers Pollution Acts, which are both protracted and very expensive.

I would suggest that the proper remedy is to place all factories under the control of the County Councils, who should have the power to issue a licence to a factory before the latter can carry on its operations. This licence should only be issued on the factory undertaking to deal with its "waste" in such a manner as to cause no injury by pollution, or damage to systems for the successful treatment of sewage at sewage works; that the onus of dealing with the "waste" and providing a proper method for its treatment should be placed on the factory owners; that the County Council should have power to withdraw its licence if the methods for treatment prove in their opinion to be inefficient; and that the right of appeal to the Ministry of Health should be given to the factory owners if they are dissatisfied with the refusal of the County Council to issue a licence, or the withdrawal by the County Council of a licence already issued.

An opportunity for granting County Councils such powers as I have suggested is given by the proposal of the Government to amend the Milk and Dairies Act 1915.

It would not be wise to give such powers to any District Local Authority where the factory is placed, as local interest might conflict too much with public duties, and, moreover, a District Authority would probably shirk taking proceedings which might involve a considerable cost to the rate-payers in that district.

There is, moreover, a precedent to be found for this in recent legislation by the Government in Holland, where the Dairy trade is subject to licence under strict regulations which deal amongst other matters, with the character of the works in a factory.

The matter is of urgent national importance in view of the magnitude of the operations of these factories, and the enormous quantities of "waste" they have to deal with and it is hoped that the County Councils Association, as representing the Local Government of the country, will exert its influence on the Government to deal with this matter without undue delay.

---

## III.—MILK RECORDING.

UNDER THE SCHEME OF THE MINISTRY OF AGRICULTURE.

*By Harold Jackson.*

Many Englishmen have the habit of criticising adversely our own institutions, if no foreigner happens to be present, but there should be no destructive criticisms regarding the Scheme of Milk Recording as organised by the late Board and carried on by the present Ministry of Agriculture. It is certain that a proportion of the dairy cows of this country, so far from being profitable, are a direct loss to their owners, that is to say, their yield does not pay for food, attendance, and a proper share of their initial cost. There is, however, great apathy with many rearers of dairy stock which must be overcome, and it is up to every Englishman interested in agriculture to use his best endeavour to help forward this great movement. Great care and thought have been given to the scheme so that the least possible additional work is given to the farmer, and yet at the same time records of every milker in the herd are secured ; records that are sound and above suspicion and on which the Ministry of Agriculture may with confidence set their seal.

The cost to the farmer varies in different counties from about 4s. to 8s. per cow and there is a grant from the Ministry up to £3 10s. 0d. per herd to the Milk Recording Society. This grant, though small, just enables the societies to carry on and to perform the work efficiently, but there is no surplus, and if the movement is to receive that widespread support it so well deserves, private individuals must endeavour to see that every farmer having a dairy herd is induced to join his County Society, or, if necessary, to form a new County Society.

The Milk Recording Scheme necessitates the marking by tattooing of the cows, and also, if wished, their progeny (if notified within 10 days of birth), thus providing a permanent means of identification throughout their life.

It provides for the scrupulous testing of the yield of milk from every cow, year after year, so that the life history may be followed throughout successive lactation periods ; and this history of the ordinary farmer's non-pedigree cow may be followed in the Register of Dairy Cattle issued annually by the Ministry, and which provides a permanent record. In the years to come, progeny that can trace the yields of their dams in the heavier records for two or three generations are going to be valuable.

The sales of Recorded Stock which have been held in various parts of the country show clearly that a really good cow, not too old, with a record of say 1,000 or 1,100 gallons has some 40–50% added to her value by the record; but on the other hand worn-out cows with heavy records do not increase in value to more than a possible 10% or 15%. These figures represent the higher records, but speaking generally an increase of £10 to £20 in value per head may be expected from all records over 750 gallons. It is, of course, important that even recorded cows be got up into good sale condition as buyers are apt to look askance at a cow which is short of flesh, notwithstanding the fact that her record provides the best possible excuse.

Every dairy stock farmer has, or ought to have, some cows of which he is proud, possibly on their typical good form, but the day is drawing to a close when dairy cattle will be judged at Beauty Shows on form only; they will also have to prove their capacity for work, and it will only be when perfection of form is combined with the actual milk production that success will be achieved. The figures obtained from taking milk records tell the farmer definitely which cows give the highest return for the food consumed and point clearly to those which he ought to use for replenishing the herd, and the register previously mentioned provides him free of cost with the herd book in which he may enter his best cattle. It is impossible to judge accurately of the yield of a cow merely by inspection of the milking pail. Milk records must be kept and unprofitable cows weeded out. If this is done a great improvement in the value of the herd can be confidently expected in the first few years during which milk recording is practised. Naturally the lower the standard of the herd to start with, the greater and more rapid will be the improvement.

Records have also proved that the milking qualities of the herd depend to a great extent upon the parentage of the bull. Unless the bull comes from a deep milking strain, his descendants will almost certainly suffer in their capacity as milk producers. The Ministry of Agriculture provides assistance to Bull Societies, so that where farmers cannot keep a good bull, they can club together, form a society, and obtain one, having good milk records in his pedigree.

One is sometimes asked, "What can a farmer learn from milk recording that he cannot find out from occasional measuring of the milk?" Nothing less than weekly weighings provide a moderately correct estimate of the total yield of a cow, and even these may be 30 or 40 gallons wrong in the year, as proved by figures taken from

daily weighings, which are, of course, the only absolutely accurate method.

Milk recording proves conclusively, if carefully studied, which cows utilize their food to the best advantage, which cows have the strongest and most efficient digestive organs, organs that can transform the greatest quantity of food into the greatest quantity and best quality of milk, and under other conditions have the same ability to transform the food quickly into beef. Moreover, a cow does not require the same food ration when she is yielding only a gallon of milk per day as when she is giving her maximum yield. Only a carefully kept record will supply a satisfactory basis for computing the quantity and composition of the daily ration on a scientific scale, so that no food is wasted. The economies effected in a dairy herd of say 20 to 30 cows over a period of a year would be very considerable.

Usually the first indication of sickness with a beast is refusal or partial refusal to take food, but with cows in-milk there is almost invariably a fall in the milk yield before this loss of appetite occurs, and if daily weighings are taken the fall is noted and steps can be taken to prevent the ailment becoming serious.

The Dairy Shorthorn Association has ably assisted the movement and opened its register for non-pedigree foundation cows of good Shorthorn type, which have yielded over 8,000 lbs. of milk in the year, or an average of 6,500 lbs. in two or more consecutive years, and have been mated with a pedigree Dairy Shorthorn bull; these cows at once become more valuable, and when the fourth generation is reached, the use of pedigree bulls having been continued, they are eligible as full pedigree Dairy Shorthorns, thus giving the ordinary small farmer of the country the opportunity to establish a pedigree dairy herd at very little additional cost.

Surely, English landowners, blessed with a better education, and English farmers, with all the history of their forefathers connected with the improvements in Stock breeding for which our country is so justly famed, ought not to be apathetic and hang back, with such schemes ready to their hand; schemes that will put money into their pockets; that will enhance their reputation as stock breeders, and, most important of all, will enable Britain to retain the premier position in stock-rearing which she has held for centuries.

Many of the Breed Societies have their own scheme of recording, but even in these societies many of the best breeders have adopted the scheme of the Ministry of Agriculture as they consider the seal of the Ministry on their records more valuable, and it will not be



very long before purchasers of Dairy Bulls are insisting on having a certificate from the Ministry for the yield of the bull's dam.

The Ministry of Agriculture have very kindly provided the following figures, which show clearly the increase in the movement since 1915, and include the approximate figures up to the first of October, 1920.

## MILK RECORDING STATISTICS.

Year ending.	No. of Members.	No. of Herds.	No. of Cows.	No. of Societies.	No. of Certificates Issued.	No. of Cows entered in Dairy Register.
Mar. 31, 1915	264	306	7,331	16	..	..
.. 1916	350	398	9,800	20	637	..
.. 1917	441	495	12,950	22	834	..
Oct. 1, 1917	503	555	14,404	25	2,189	572
.. 1918	639	708	19,793	27	4,178	1,560
.. 1919	1,191	1,332	38,000	40	7,373	2,320
.. 1920	*2,000	*2,200	*50,000	51	Not yet	Issued.

Taking the year ending October 1st, 1919, for which the Register of Dairy Cows has just been issued, it contains much valuable information and the records of some 1,630 Shorthorns, 294 Friesians, 182 Crossbreds, 91 Lincoln Reds, 46 Red Polls, 33 South Devons, 13 Devon, 11 Jerseys, 5 Ayrshires, 4 Guernseys, 3 Kerrys, 3 Herefords, 3 Welsh Black, and 2 Park Cattle.

The highest yield given by a cow is 19,588½lbs. and this cow, a Friesian, has in the two preceding years given 15,701½ and 16,611½lbs., or an average of 17,300½lbs. for three successive years; which is a wonderful record of sustained work at high pressure. Twenty-nine Friesians and twelve Shorthorns gave yields of over 12,000lbs., and the contest for eventual supremacy between these two breeds is going to be a close one, each having points distinctly in its favour.

Many of the very heavy yields are being obtained by milking the cows four or five times daily during the earlier months of lactation and feeding on highly stimulating foods; whether this is a wise policy or not has still to be decided, it is, however, definitely known

\* Estimate only, no figures yet available.

It was decided in 1917 to change year end to October 1st.

that it increases the yield of milk from 10 to 20 per cent. more than would be given if they were only milked twice daily. The milk is generally rather poorer in quality and undoubtedly the stress on the cow is much increased, and this must tell on its vitality and also on the vitality of the unborn calf. Two thousand gallon records may be a great advertising factor, but they cannot compensate for a herd which has lost its stamina.

It is a pity that more Ayrshire cattle do not figure in the register, though the Ayrshire Cattle Milk Records Committee was one of the earliest undertakings of this sort in the country. These cows have the most perfect udder formation of any breed, and it is much to be desired that breeders of this type will endeavour to put them into the comparative competition by recording them and applying for certificates when eligible.

The Central Council of Milk Recording Societies is now taking up the question of testing for butter-fat so that breeders may have and use this information in selecting and mating their stock, but no certificates will be issued on the tests, mainly owing to the fact that it is next to impossible to prevent fraud, if the breeder happens to be a rogue. Some of the methods which have been practised and all of which give falsely high yields of butter-fat are :—Leaving the strippings in the udder at the milking previous to the test, or nipping the teats so that the cow holds her milk, which has the same effect ; adding cream to the milk when milking by a concealed bottle in the sleeve, or a football bladder under the arm, and a tube down the sleeve, and, lastly, by injecting cream directly into the cow's udder ; therefore, the only possible way to absolutely prevent fraud so that certificates could be safely issued would be for each cow to be handed over to officials who would be strangers to the cow, for a period of not less than 48 hours, and kept under lock and key. It is, of course, an entirely different matter, when the breeder desires the information to assist him in the retention and mating of his stock, and it is this information, for his private use only, which the C.C.M.R.S. hopes to organise so that the various county societies may place it at the disposal of their members.

The Channel Island cattle, which give the richest milk and are valued for the amount of butter-fat produced per annum, rather than for the actual yield in gallons of milk, are on a somewhat different plane, and although not generally recognised, their milk should be worth a higher price per gallon than that of the heavy milk producing breeds.

Probably the ultimate type of Dairy Cow will be the one which will put on the best quality of beef in the right places quickly, but

breeders should make milk production the *sine qua non*, and then use every endeavour to raise the standard of type; but even milk recorders must not lose sight of the fact that approximately one half the offspring are males and that only a small number of these are worthy or necessary to retain as bulls, and a dairy breed that will also produce good quality rapid feeding steers must of necessity be the most profitable if they produce a reasonable quantity and quality of milk.

---

#### IV.—VEGETABLE GALLS.

*By Harold Bastin.*

##### VEGETABLE GALLS DEFINED.

What is a vegetable gall? It has been described as a hypertrophy—that is to say, a morbid enlargement—of a part of the plant body, due to parasitic agency. Swanton\* says, “Galls arise only from embryonic tissues which have received undue stimulus . . . . The protoplasm of cells predestined to give rise in ordinary course to the plant or its parts has been so affected by the parasite that these cells deviate from their normal mode of growth, become phenomenally active, elaborate a new plan of construction, and give rise to the overgrowths familiarly known as galls. To term the parasite a “gall-maker,” as many writers have done, is to convey an utterly erroneous idea of its function. It makes nothing but induces much.” Bearing these points in mind, it is not difficult to understand how it is that plant galls have been compared (by Sir Ray Lankester and others), with those terrible growths known as cancer. But there is this important difference, that whereas the gall arises through the agency of some recognisable parasite, the “cancer bacillus” (if such a thing exists) remains unknown. Furthermore, it is a fact that relatively few galls affect seriously the vitality of the plants upon which they are produced. There are, as we shall see later, numerous exceptions to this rule. But in general it may be said (speaking from the standpoint of the plant pathologist) that a gall is no more than a small non-malignant tumour, which—in the majority of instances—will be got rid of when the leaves, or other deciduous organs, are shed.

---

\* “British Plant Galls.” E. W. Swanton (Methuen & Co., Ltd., 1912).

## THE CAUSERS OF GALLS.

It is said that the first mention of vegetable galls in literature is made by the Greek naturalist and philosopher Theophrastus (372–286 B.C.), who speaks of the superior quality of the gall-nuts of Syria—doubtless the so-called “Aleppo galls” which on account of the high percentage of tannic acid in their composition, were then, as now, a valuable article of commerce. Thereafter, frequent references to galls occur in old works which treat of natural history and kindred topics. But the earliest systematic writer on galls was the Italian naturalist and physician Marcello Malpighi, who in 1686, published his treatise “De Gallis,” in which he described all the galls of Italy and Sicily that were known to him. Some years earlier than this Dr. Martin Lister, the physician-in-ordinary to Queen Anne, had placed on record his observation that certain insects are always found in association with certain galls, although he does not seem to have suspected that the insects had a vital connection with the galls as cause and effect. This fact was definitely established by Malpighi, who believed that the distortion of the vegetable tissue called a gall was due to a poisonous liquid injected by the insect when laying its egg—for he knew that in so far as insect-caused galls are concerned, an insect *does* lay an egg, or eggs, in the plant tissue at some time preceeding the commencement of the growth of the gall structure.

## POISON NOT INJECTED.

Up to comparatively recent years, the opinion was almost universally held among naturalists that insect-caused galls arose solely through the injection of an irritant poison, and (as an explanation of the remarkable constancy in form, colour, etc., which galls exhibit), that each kind of insect had its own peculiar poison. The theory was plausible and not to be disproved without long-continued research work of a particularly arduous kind. Darwin, Riley and Sir James Paget all lent it their support. But now, thanks to the labours of Adler, Cameron and others, it can be stated definitely that—at all events in the important family of the *Cynipidæ* (gall-wasps)—no poison is introduced by the insect when egg-laying. True, it may be seen to inject a minute drop of fluid into the wound which it makes in the plant; but probably this acts either as a lubricant to the operation of the ovipositor, or as a kind of varnish to seal up the injury. It is certainly not a poison. Among these *Cynipidæ*, it has been ascertained beyond doubt that

the formation of the gall does not commence until after the larva, or grub is hatched, even though the hatching may be postponed for a considerable period subsequent to the deposition of the egg. There is, therefore, strong presumptive evidence that with these insects the gall takes its origin from the irritation set up by the gnawing of the grub—although, of course, poisonous exudations from the creature's body may have something to do with it. With the gall-causing sawflies (family *Tenthredinidæ*), the growth of the gall is complete, or far advanced, before the egg hatches; but even in these instances it is known that the egg itself undergoes changes, increasing in size, and thus probably supplying the stimulus—the irritation—which forces the plant to produce a gall.

#### NO ALL-SUFFICIENT THEORY.

Cameron\* sums up the question by saying that “Even in the Hymenoptera we find two radical distinctions in the habits of the insects; that is to say, in the *Tenthredinidæ* the gall is already formed before the larva quits the egg, while in the *Cynipidæ* the birth of the larva is synchronous with the formation of the gall. Until the larva is born and commences to feed there is no gall formation.” Indeed as Cameron remarks, the origin of gall structures cannot be explained comfortably by any one theory, because the habits of the insects associated with them are so very diverse, and in many instances so imperfectly understood. Moreover, we must not forget that many remarkable galls are in no way connected with the egg-laying of insects. They arise after a minute parasite (usually a mite or an eel-worm) has gained access to the plant tissue. We shall also see that the intrusions of parasitic fungi, bacteria, etc., sometimes give rise to galls of definite character. It may seem difficult to believe that the swelling of a minute egg, the gnawing of a tiny animal, the exudations from its body, or the chemical changes associated with the growth of a microscopic fungus, should so far disorganise the normal course of cell development that an elaborate gall-formation results. But we must remember that the tissue that is affected is what botanists term “meristem,” which is the particular layer of vigorous cells whose active multiplication by fission brings about the phenomenon that we call “the growth of the plant.” These cells are extremely sensitive; and it is not, therefore, unreasonable to assume that an

---

\* “British Phytophagous Hymenoptera.” Peter Cameron (Ray Society), Vol. IV. MDCCCXCIII.

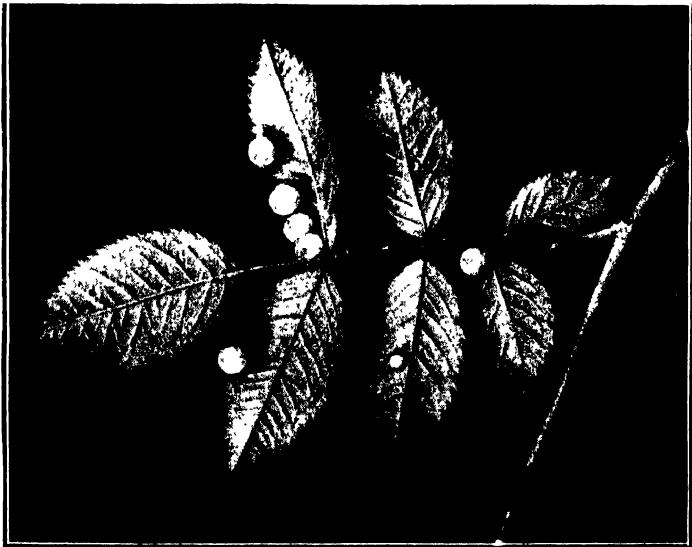
PLATE I.

Fig. 1.



" Horse-bean " Galls, caused by a Sawfly, on willow leaves.

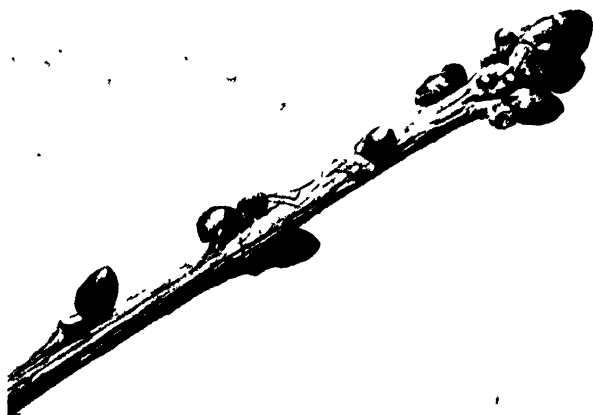
Fig. 2.



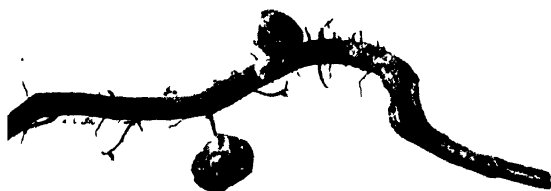
Galls commonly found on wild rose leaves, caused by a small gall-wasp.



PLATE II.



This wingless insect is the "parent" of the familiar "oak-apple" gall.



Galls on an oak root, in which the oak-apple gall-wasp is bred.



One of the above galls cut open and magnified, showing a gall-wasp grub in its cell.





PLATE III.

Fig. 1.



Young turnips badly galled by the weevil *Centorhynchus sulcicollis*.

Fig. 2.



Half a young pear (magnified) containing grubs of *Diplosis pyrivora*.



PLATE IV.

Fig. 1.



Shoot attacked by the " Currant  
Blister Aphis."

Fig. 2.



" Big Bud " of Black Currant  
caused by a species of Mite

Fig. 3.



Galls on the roots of Alder. They are believed to be caused  
by a fungus - *Frankiella alni*.



irritant, however slight, would serve to divert the energy which in normal circumstances serves to build up the plant tissue. It is fairly clear indeed, that in this diversion of cell energy—induced in one way or another by the vital processes of the parasitic organism—lies the secret of all gall formation.

#### GALLS "COME TRUE."

The constancy of galls in form, colouring, texture, etc., is very remarkable. Swanton remarks that this extends "even to minute peculiarities in the epidermic covering, and (galls) are thus easily recognisable, though their causers are often—especially amongst the *Cecidomyidæ*—so nearly alike that it is difficult to distinguish them. In America the Willow *Salix humilis* is attacked by ten gall gnats which cause distinctive galls, but it is almost impossible to diagnose the insects, the galls forming the best clue to specific identity." A less striking, but more familiar instance may be cited. In our hedgerows may be found commonly galls of three kinds on the leaves of wild roses. These are caused by three Cynipid gall-wasps of the genus *Rhodites*. Only the expert can tell the three insects apart. Yet the galls from which they are bred are widely different. First there is the familiar "bedeguar" or "robin's pin-cushion" caused by *Rhodites rosæ*. This gall houses a kind of community, being made up of numerous cells, each containing a larva, or grub. Secondly the species called *Rhodites eglanteriæ* (Plate I, Fig. 1) causes one-chambered galls, about the size of a pea on the underside of the leaves; while the third species, *R. nervosus*, comes from galls which are perfectly distinct because they have spike-like projections from their surface. Almost any hedgerow in the South of England will supply specimens of these three galls, so that the reader may readily compare them, and—if he is so inclined—breed out their respective inmates. We shall have occasion on a later page to call attention to the numerous, nearly related gall-wasps which are associated with the oak tree, and the very diverse galls to which their attacks give rise. For the moment, our object will be served if we emphasise the fact that all these galls have definite "specific" characters of their own. In other words, the many hundreds of different kinds of galls known to science invariably "come true." Exactly why this should be is not easily explained. But one may imagine that the vital energy of the plant and its parasite, conjoin, and have issue in a novel production whose distinctive features are derived, perhaps in varying proportions, from both parties in the union.

## IMMUNITY TO PARASITIC ATTACK.

From what has already been written, the reader will readily infer that gall-infestation is not transmissible from one generation of plants to another. That is to say, plants grown from seed produced by a parent stock that has been subject to gall-infestation will not themselves develop galls unless they are visited in their turn by the gall-causing organisms. It is, moreover, a fact that certain species of plants, and certain individuals of one and the same species, are relatively immune from the attacks of gall-causing parasites, while other species and individuals are peculiarly susceptible. We have already referred to the oak as being remarkable among forest trees on account of the very large number of gall-wasps, with which it is associated. Against this we may set the horse chestnut which, so far as is known, produces only four galls, all obscure, and not one of which has been observed in Britain. With respect to the immunity of individuals, Swanton remarks that "a birch tree laden with 'witches' brooms,' and having its branches in actual contact with those of another birch quite free from them, is no uncommon spectacle. It may be suspected that the descendants of the former would show the same predisposition to attack, and the descendants of the healthy tree the same immunity." The same authority gives us interesting particulars of an experiment which he conducted in the late summer of 1911, when the so-called "oyster gall" (*Andricus ostreus*) of the oak was extraordinarily abundant so much so that the discoloration of the foliage of infested trees marked them out, even at a distance, from those which were not infested, and whose leaves remained green. From two such contrasted trees twigs were gathered at random—a twig from each tree. One twig had ten leaves, on which were counted 228 galls, and of these no less than 188 were "oyster galls." The other twig, notwithstanding the fact that it had fifteen leaves, supported only three "spangle galls"; thirteen of the fifteen leaves were entirely without galls of any kind. Such facts as these suggest questions which are manifestly deserving of careful investigation. "How (asks Swanton), is the comparative immunity of the latter tree to be explained? Is there some special substance in its plasma which has a deleterious effect upon the egg of the insect? I determined, by microscopic examination, that many of the leaves had been punctured, but no gall growth had followed."

## GALLS AND DOUBLE FLOWERS.

Severally investigators have shown that plants may be induced artificially to produce gall-structures, notably double flowers—i.e.

flowers with the stamens changed into petals—as the result of the stimulus applied by mites and aphides. The most noteworthy of these records are those of Peyritsch, published in 1888. But ten years previous to this Kerner had noticed that some plants of *Veronica officinalis* produced double flowers in consequence of the settlement of mites upon them, whereas adjacent plants which were free from mites produced normal flowers. In the following year the mites attacked the other plants, with the result that the majority of their flowers were double, as well as those of isolated plants on which the observer had placed mites by way of experiment. Kerner\* adds: “*Veronica officinalis* has only two stamens in each flower, and in the double flowers both these and the two carpels are changed into petals, so that, of course, we could not expect fruit and seed from them. It would not be impossible, however, that flowers of other plant families, which are provided with a large number of stamens, might behave differently. It might happen, for example, that only *some* of the stamens would be changed into petals by the gall-mites, and that the carpels would remain capable of fertilization. If on such plants fruits and seeds capable of germination should ripen, the latter might perhaps produce plants with completely and half-double flowers. This would be explained by supposing that the alteration undergone by the protoplasm of the cells in the outer part of the flower had extended to the inner, especially to the ovules and seeds, and further to the plants proceeding from these seeds. I would therefore, not undertake to state that the Stocks (*Matthiola annua* and *incana*), the Wallflower (*Cheiranthus cheiri*), the Pinks (*Dianthus caryophyllus*, *plumarius*, etc.), the Poppies (*Papaver rhoeas* and *somniferum*), various Ranunculaceæ (*Delphinium*, *Paeonia*, *Ranunculus*), and many other plants which have long been cultivated in gardens with semi-double flowers, and which produce such flowers when propagated by seeds, had not gained this characteristic in the first place by the influence of gall-mites.”† This is an extremely interesting speculation; but so far as the present writer is aware, no attempts have yet been made to support it by facts.

#### GALL CAUSERS CLASSIFIED.

Gall-causing organisms may be roughly classed under four headings, viz: (1) insects, (2) mites, (3) eelworms and (4) fungi—the last term

\* “Natural History of Plants.” Anton Kerner von Marilaun, translated by F. H. Oliver (Blackie & Son, Ltd., 1895). Vol. II, pp. 553-4.

† Such a conclusion would not be allowed by those who are opposed *in toto* to the theory of the inheritability of “acquired characters.” Kerner himself refers to his remarks as the “merest suppositions,” and adds that “at present we have not the data on which to base any definite conclusions.”



being used to cover both the simple plants, such as bacteria, moulds, mildew and the larger "toadstools," and the Mycetozoa, which from the standpoint of the systematic naturalist seem to occupy a sort of half-way house between the animal and vegetable kingdoms. In succeeding paragraphs we shall cite examples of galls caused by organisms belonging to all these four groups, giving preference to those which are of outstanding economic importance, or that are calculated to attract the attention of the agriculturist and forester in the course of their duties. Beginning then with the insects, we find that no less than five of the great groups, or orders, comprise gall-causers among their members—these orders being Hymenoptera, Diptera, Coleoptera, Lepidoptera and Hemiptera.

#### GALLS CAUSED BY HYMENOPTERA.

The order Hymenoptera includes the ants, bees, wasps, ichneumon-flies, saw-flies and their allies. It is divided into two suborders, viz: Symphyta and Apocrita; the first comprises the saw-flies, while the second embraces all the other families. There are several common gall-causing saw-flies, including one (*Bleniocampa pusilla*), which attacks the leaves of wild and cultivated roses, causing the margins to roll upwards. Theobald\* classes this insect among the "enemies of the rose," and tells us that when one leaf is killed the larvæ which have destroyed it pass to another. The rolling of the leaves appears to be mainly due to the activities of the larvæ, although Cameron says: that they are aided by the incisions made by the female insects when they lay their eggs. Other saw-flies cause galls on the pear, the bracken, and the willow the latter being galled by several species, the best known of which is commonly spoken of among entomologists as *Nematus gallicola* (Plate I, Fig. 2), although its more correct appellation appears to be *Pontania proxima*. The attacks of this insect give rise to the familiar "horse-bean galls," which are often so abundant on several species of willows, although the "crack" willow or withy (*Salix fragilis*) seems especially susceptible. During April or May, the parent insect lays her eggs, by means of her wonderful twin-saw ovipositor, within the leaf-buds; and as the leaves unroll, the gall-structures develop, and assume their characteristic bright crimson colour. For several weeks each gall is a solid mass of vegetable tissue with the egg lying in a small cavity near the centre. Then the larva hatches and feeds upon the inner portion of the gall from

\* "Enemies of the Rose." F. J. Theobald, (1910), pp. 51-2.

which, when full-fed, it issues and drops to the ground. Here it forms a tiny cocoon of earth grains spun together with silk, changes to the pupa, and ultimately appears as a perfect saw-fly. This happens normally in August; and each newly emerged female oviposits in developing leaf buds, with the result that a second generation of galls shortly appears. Thus, this willow saw-fly is said to be double-brooded, *i.e.*, it achieves two complete life-cycles in the course of each twelve months.

#### THE TRUE GALL-WASPS.

Apart from the saw-flies mentioned above, all the gall-causing Hymenoptera belong to the sub-order Apocrita and are almost exclusively comprised in one family, viz., *Cynipidæ*.\* These insects are the true gall-wasps. In common with other Apocrita, the abdomen is more or less obviously constricted behind the first segment to form a "waist"—such as is familiar in the wasp or hornet. Moreover, the larva is invariably a helpless grub, soft and legless. These two points alone serve to separate the Apocrita from the Symphyta, among which the abdomen is not basally constricted, while the larva, even in species which are almost completely inert, never quite loses the caterpillar form which is characteristic of all the free-feeding kinds. Gall-wasps are all tiny insects, practically unknown to the casual observer. Yet many of the galls which they cause are among the most familiar objects of the countryside. The larger number of these occur on the oak. For example, most people who have dabbled in natural history will be able to identify oak apples, cherry galls, spangle galls, button galls, woolly galls, artichoke galls—to mention only a few of the kinds whose ubiquity and distinctiveness have won for them popular names. Attention has already been called to several galls caused on wild roses by members of the genus *Rhodites*. The little burnet-leaved rose is frequently attacked by another species (*R. spinosissima*), the galls occurring often in considerable numbers, on the stem, leaves, petioles and flower buds. Conspicuous swellings are caused on bramble stems by a gall-wasp called *Diastrophus rubi*. Then there is the genus *Aulax*, with *A. glechomæ* which causes hairy galls on leaves of the ground ivy; *A. hypochaeridis* which gives rise to swellings on the stems of the long-rooted cat's-ear, and *A. papaveris* which attacks poppies, causing the seed capsules to become more or less swollen and deformed. *Aulacidea hieracii* causes swellings in the stem and root of the common hawk-weed, yellow toadflax and couch-grass.

---

\* Two British species of the family *Chalcididæ* cause galls on grasses.

## ALTERNATION OF GENERATION AMONG GALL-WASPS.

The life-histories of gall-wasps present some intensely interesting phenomena. Take for example, the insect which is responsible for the well-known "oak apple" or "King Charles's apple." This insect (Plate II, Fig. 1), which is wingless, creeps up the trunks of oak trees in the depth of winter and lays her eggs in the leaf-buds—terminal buds being most commonly selected for the purpose. She is equipped with a long ovipositor, or egg-tube, which she inserts between the closely wrapped bud scales, and thus deposits a mass of translucent, stalked eggs at the heart of the mass of embryo leaves. All oak buds that have been thus tampered with develop into apple galls in the springtime; and within these galls the grubs that hatch from the eggs are nourished upon the sap which, strictly speaking, is furnished by the tree for the development of its leaves. Each grub lies in a separate cell in the substance of the gall, and there changes in due course to a pupa. In June, the perfect insects bore their way out of the galls. Now these gall-wasps differ remarkably from their parent—the wingless insect which laid her eggs in the oak buds. They are inferior to her in size, while each has four delicate wings. Moreover, this generation of the oak-apple gall-wasp comprises both males and females, whereas the wingless winter generation consists exclusively of females endowed with the power of parthenogenesis, or virgin reproduction. Also the females of the winged summer brood behave in a manner quite different from that which was adopted by the larger wingless female of the winter brood. Instead of ovipositing in buds, they work their way beneath the shallow soil and lay their eggs within the tender rootlets of the oak. (Plate II, Figs. 2 and 3.) As a sequel, galls are produced on these rootlets; and in them the winter generation of wingless females comes to maturity. These root galls are much smaller and harder than oak apples, and resemble nuts of irregular shape. Each has only a few inmates (perhaps only one or two), whereas the average oak apple will contain several scores of grubs. These facts were not known to the earlier naturalists, who gave the insects which emerge from each kind of gall a different name, calling the oak-apple gall-wasp *Teras terminalis*, and its root-gall form *B. aptera*. For the sake of convenience these names are still retained; we must bear in mind, however, that they do not designate two different kinds of insects, but merely two alternating forms of one and the same species. A phenomenon so remarkable as alternation of generation has

naturally given rise to much discussion and theorising. So far no very adequate explanation of the facts has been advanced, although Weismann\* says, "we see here quite clearly why the two generations had to become so different; simply because the winter generation had to adapt itself to different conditions from the summer generation, above all as to the laying of its eggs within the tissues of a plant of a different constitution." But the problem is really less simple than at first sight may appear. It involves the case of the marble gall-wasp (*Cynips kollari*) and certain other species, which have only one generation in the year—all the individuals being females! A description of the life-history of *C. kollari* will be found on page 59 of last year's issue of this Journal. No male representative of the species has ever been discovered, although from time to time entomologists have bred many thousands of specimens in captivity. Among British *Cynipidæ* therefore, we recognise three grades of life-cycles, viz: (1) species (such as those comprised in the genera *Rhodites* and *Aulax*), with only one generation, consisting of males and females; (2) species such as *Cynips kollari* with only one generation, but no males; (3) species (such as the oak-apple gall-wasp), with alternating generations, the one agamous, the other sexual. Observation of the first group has shown that at least in certain species parthenogenesis is prevalent. In the case of the bedeguar gall-wasp, for example, it is probably the rule, seeing that the males of this insect are excessively rare. We may suppose, therefore, that the males tend to disappear as the faculty of virgin reproduction increases: and thus we find a possible clue to the mystery of the marble gall-wasp which as we have seen, has no males at all. But in the present state of our knowledge it seems impossible to explain adequately the phenomenon of an agamous generation alternating with a sexual one.

#### GUEST-FLIES AND PARASITES.

Certain Cynipid galls are remarkable for the number of guest-flies and parasites which they contain. Swanton arranges these "lodgers" in three groups, which may be described somewhat as follows:—

1. *Inquilines*. These are the first sort of guest-flies, more or less nearly related to the rightful occupants of the gall. The

---

\* "The Evolution Theory" August Weismann. Translated by J. Arthur and Margaret R. Thomson. (Edward Arnold, 1904. p. 246).

larvæ live in the gall substance, and usually secure the maximum food-supply by killing off the owners by pressure.

2. *Commensals*. The second sort of guest-flies, which feed on the gall-substance, thus depriving the rightful occupants of some of their food-supply. They do not, however, kill off the legitimate owners of the gall.
3. *Parasites*. These prey upon the larvæ and pupæ, not only of the rightful gall-owners, but also of inmates belonging to the two former classes. They are members in the main, of the family *Chalcididæ*—which includes large numbers of the smaller “ichneumons,” of the order Hymenoptera.

The late Mr. Francis Walker collected a quantity (the number is not given) of common oak-apple galls, and from them reared seventy-five species of insects, representing no less than seven orders—not to mention a few spiders and mites. In all, there were upwards of 55,000 individuals! Of course, the precise status of many of these “hangers-on” remains obscure, even at the present day; but we may take it that they were all beholden, either directly or indirectly to the original gall-causer.

#### THE ECONOMIC ASPECT OF OAK GALLS.

It is a remarkable fact that the galls found upon the oak, notwithstanding the extraordinary numbers in which they frequently occur, seem for the most part not to affect the vitality of their host. There are, however, a few exceptions. In last year's issue of this Journal, the present writer instanced *Spathogaster tricolor* as a gall liable to hamper the growth of very young oak saplings, and *Cynips kollari* as being even more harmful when it becomes excessively numerous. Several of the galls which occur on the leaves, such as the spangle-gall (*Neuroterus lenticularis*) and the oyster-gall (*Andricus ostreus*), cause premature withering of the foliage and must thus, when very numerous, impose a serious drain upon the resources of the tree. Miss Ormerod refers to the former gall, and the injurious way in which its numbers sometimes “completely load the back of the leaves”; while in reference to the latter, Swanton has the following note for the year 1911. “Quite early in the summer the leaves of *Quercus pedunculata* in many districts showed marked peripheral browning . . . . In the Haslemere district the majority of the trees shed their leaves prematurely, and it cannot be doubted that their growth was seriously checked.” In regard to *Cynips kollari* Cameron remarks: “Various attempts have been made to utilize

these galls for ink-making purposes, but without any practical results, owing to the paucity of tannic acid they contain as opposed to the Aleppo and other galls- only some 17 as against over 50 per cent. The only use made of them is for ornamenting fancy baskets, fern-cases, etc. That the species is injurious in many instances there can be no doubt. It only frequents stub or young oaks, not over 3 or 4 feet high. These, when they appear in numbers in nurseries, they frightfully distort, and not infrequently render saleless." The statement that this gall only occurs in numbers on stub and young oaks, while it was probably true when Cameron penned it, does not now hold good. Certainly it is to young stock that this gall is most harmful: but during recent years it has been spreading to full grown oaks, and may now be seen - at all events in Hampshire and Berkshire - extending right to the tops of tall trees.

#### GALLS CAUSED BY DIPTERA.

The number of galls caused by species of Diptera, or two-winged flies, is considerable, the majority being due to the activities of members of a single family, viz., the gall-midges or Cecidomyidæ. A brief note concerning some of these insects was given on page 57 of last year's issue of the Journal, where special reference was made to the gall-midges which injuriously affect willows and osiers. The reader is also referred to an article contributed to Vol. VIII of the Journal (1912-13, p. 28 *et seq.*), for details of the life-histories of that notorious Cecidomyid the Hessian Fly (*Cecidomyia destructor*), and of the Ribbon-footed Corn-fly, or Gout-fly (*Chlorops æniopus*). Both these insects must be classed with gall-causers, since they induce a characteristic hypertrophy in the plants which they attack; whereas in the case of the Corn Saw-fly (*Cephus pygmaeus*), mentioned in the same article, nothing in the nature of a gall-structure arises. Here it may be mentioned that the original genus *Cecidomyia* has undergone much revision of late years, and has been split up into many new genera. For instance, the Hessian Fly is now more correctly referred to as *Mayetiola destructor*, than as *Cecidomyia destructor*. To the practical man, however, such distinctions as these are of little moment, except in so far as they tend to render the literature of the subject less easy for the novice to comprehend.

#### THE FRIT FLY.

Not distantly related to the Gout-fly is the Frit-fly (*Oscinis frit* - *O. vastator* of Curtis). It too, is a definite gall-causer, since gnawings of the larvæ at the hearts of young plants causes the new shoots

to become swollen and distorted. Much mischief is done by this pest to cereals and pasture grasses both in Europe and America. In this country it is chiefly injurious to oats, although barley may also suffer. There may be as many as three generations of the fly in the year, and the larvæ of the middle generations appear to feed normally in the grain of the young ears. The flies appear first in April and the beginning of May, and lay their eggs on the leaves of the young plants, into the hearts of which the larvæ work their way. The second generation of flies appears in July, and these insects lay their eggs either on pasture and wild grasses, or in the young ears of oats and barley. By August and September the flies of the third brood appear and lay their eggs on such grasses as may be in suitable condition. The symptoms of attack are pale spots on the leaves, the result of the gnawing of the larvæ before they proceed downwards and inwards; a browning or reddening of the leaves; and a stunted growth and failure of the plant. Attacked grains are hollow, shrunken and shrivelled. The plants are by no means always destroyed, as there is frequently a tendency to tiller; but the new shoots (as we have already seen) are usually dwarfed and swollen, and simulate the appearance of eelworm infestation which will be described in a later paragraph. In order to guard against attack by the Frit-fly, it is advisable to sow oats as early as possible, so that the plants may make some progress before the first brood of flies appears. When an attack is feared, or noticed early, a stimulating dressing should be given. Badly infested plants cannot be saved, and should be ploughed in deeply: while wild grass which is known to be harbouring the pest should be destroyed during the winter months.

#### THE PEAR MIDGE.

There are several "wheat midges" included in the genus *Diplosis* which cause galls, and are well-known pests. Of these the worst offenders are *D. flava* which is associated with rosettes of leaves on the haulm, and *D. tritici* whose larvæ induce swelling of the glumes and flowers. The most notorious of this group of midges, however, is the pear midge (*Diplosis pyrivora*) (Plate III, Fig. 1), which often causes serious loss in orchards by its attacks on the young fruit. It is the larvæ which burrow into and feed on the developing fruitlets, which they ultimately destroy not, however, before they have converted them, technically into galls. The perfect midge, which is only about one-tenth of an inch long, appears in April and continues active until

about the second week in May. The female lays her eggs in the blossom of the pear. The eggs hatch in from four to six days, and the minute larvae work their way into the tissues of the fruitlet, which about a fortnight later begins to swell abnormally and is gradually hollowed out by the larvae. Attacked fruitlets can always be distinguished from sound ones by their characteristic deformed appearance. When the larvae are full-fed, they drop to the ground, where they change to pupæ under cover of a delicate cocoon, which is covered with minute grains of soil. The best way to check the increase of this pest is to pick and destroy the infested pears before the maggots escape, and to spread kainit beneath the trees at the time (June) when they are falling to the ground.

#### THE CABBAGE-ROOT FLY.

The cabbage-root fly (*Phorbia brassicæ*) calls for mention because it is not only a cabbage pest, but often attacks turnips; and when this happens it often induces swellings which are not altogether unlike those due to the activities of the turnip-gall weevil. Occasionally one comes across similar malformations on cabbage roots which harbour the larvae of this fly: but so far as is known no galls are caused on the wild plants which this insect attacks—shepherd's purse, charlock, Jack-by-the-hedge, etc. The cabbage-root fly is so grievous a pest in this country that no opportunity should be lost for calling attention to its existence, and to the need for resolute action in suppressing it. There are probably three generations in the year, the adult insects appearing first for egg laying towards the end of April, or early in May. It is for this reason that very early sown plants are noticed largely to escape attack. Protecting plants by means of tarred paper or cards is a preventive measure that has met with success in America, while (in gardens) sand moistened with paraffin may be sprinkled once a week round the stems. But the precaution which is likely to prove more effectual than all the others put together is conscientiously to burn all infested plants, stumps and other refuse.

#### GALLS CAUSED BY BEETLES.

It is said that more than forty British beetles are associated with galls; but in most instances the structures are very obscure, and unlikely to attract the attention of any but the enthusiastic expert. Several of the more conspicuous beetle-caused galls happen to be of definite economic importance; and two of these—the



poplar gall beetle (*Saperda populnea*)\* and the turnip gall weevil (*Ceutorhynchus sulcicollis*)† (Plate III, Fig. 2) have already been mentioned in previous issues of this Journal. Regarding the latter insect, however, it is well to emphasise the fact that the outcome of its attacks may quite easily be confused with that caused by the cabbage root-fly, or by the "finger-and-toe" organism of which we shall speak later. To guard against such mistakes, a careful examination of specimens must be made. Three other species of the genus *Ceutorhynchus* causes galls on the hedge mustard and other wild plants; and one of these—*C. assimilis* has "turnip-seed weevil" for its popular name. It causes a characteristic swelling of the seed-pod of the hedge mustard (*Sisymbrium officinale*), and feeds also in the pods of turnip, although Swanton makes no reference to this fact in his catalogue—presumably because, when the turnip pod is attacked, no true gall structure is induced. Collinge‡, however, has the following note: "Turnip seed is often badly infested with the larvæ and pupæ of this tiny beetle. Seed merchants know it as a most destructive pest, for pods which have been attacked contain few, if any, perfect seeds. In a sample of seed sent, the fat yellowish-white larvæ were present; also cocoons composed of agglutinated seeds, inside each of which I found a pupa. This beetle attacks other cruciferous plants in a similar manner. Seed known to be attacked should be fumigated with bisulphide of carbon." Apart from *Saperda populnea*, the only British beetle causing galls on forest trees is a weevil named *Brachonyx pineti*, which attacks the Scotch pine. Swanton describes the gall structure as follows: "Needles stunted, thickened in the middle, edges occluded, forming a cigar-shaped gall, the interior containing a velvety whitish larva with a black head." The only other British gall-causing weevils of economic importance are the "clover weevils" of the genus *Apion*. One of these tiny pear-shaped insects (*A. varipes*) causes excrescences to arise on the roots, while two or three other species attack the flowers, and the floral axis becomes hypertrophied. For a description of the habits of these pests the reader is referred to page 68 of the issue of this Journal for 1916-17.

\* See "Journal of the Bath and West and Southern Counties Society" (Fifth Series), Vol. XIV. p. 51.

† See "Journal of the Bath and West and Southern Counties Society" (Fifth Series), Vol. XI. p. 65.

‡ "Manual of Injurious Insects." Walter E. Collinge (Midland Educational Co., Ltd., 1912).

## GALLS CAUSED BY MOTHS.

Swanton gives a list of twenty-four Lepidopterous gall-causers found in Britain; but very few of these are likely to be noticed by the casual observer. None occur on roots, but nearly all on the stem. As an example we may take the galls caused by the caterpillars of *Hedya* (or *Gypsonoma*) *aceriana* on the twigs of the white poplar, of which there is a fine illustration (Plate 36) in Connold's "British Vegetable Galls." In his description the author says that "the larva eats its way into the young shoot, causing it to bulge considerably. In course of time cracks appear on the surface, disclosing dark brown decaying tissue within. After the escape of the imago, one crack widens until the interior of the cavity is laid bare. The larva ejects its frass through an opening at the top of the larval chamber, and instead of falling away it is retained, and a bag-like pendant mass is formed on the outside." In last year's issue of this Journal (page 56) some details were given concerning the habits of *Retinia resinella*, the "resin gall moth," which retards the growth of the Scots pine by destroying the terminal buds. Where it occurs in abundance, as it does in a few localities in Scotland, and on certain parts of the Continent, it becomes a serious pest. The larva of two other species of micro-lepidoptera, viz., *Dioryctia splendidella* and *Laspyresia cosmophorana*, are harmful to the Scots pine. They both burrow into the bark of the branches, thereby causing resinous swellings. As Swanton remarks, it is the slight hypertrophy of the twig at the part attacked, and not the resinous exudation, which alone justifies the term "gall," as applied to the structures induced by these three moths of the Scots pine.

## GALLS CAUSED BY HOMOPTERA.

The order Hemiptera is divided into two sub-orders, viz., the Heteroptera, which includes all the species which are definitely "bug-like" in character and the Homoptera, which comprises the lantern-flies, frog-hoppers, plant-lice, scale insects, and so forth. Among the British Heteroptera there are no gall-causers; but three families of the Homoptera, viz., *Aphidæ* (plant-lice or "green-fly,"), *Psyllidæ* ("jumping plant-lice") and *Coccidæ* (scale insects and mealy-bugs) all contain gall-causing species. Most of these are found among the *Aphidæ*. Reference was made in last year's issue of this Journal (page 46) to the well-known "false cone" or "pine-apple gall" of the spruce, and to the extraordinary life-cycle of the insect with which it is associated. Those who desire further

particulars of this insect, and of other species of *Chermes*, are referred to Swanton's "British Plant Galls" and Gillanders's "Forest Entomology." Certain aphides of the genus *Schizoneura* give rise to some very striking galls. As an example, we may mention the pale yellow "scroll galls" caused by *S. ulmi* on elm leaves. This insect, like so many of the *Aphidæ*, has a remarkable life-cycle, which includes seven generations, only the earlier generations being concerned in gall-production on the leaves. The notorious "American blight" aphid (*Schizoneura lanigera*) cause tumours or "cankers" on apple trees, and these, as the result of attack renewed year after year, sometimes attain enormous proportions. The deformities are not only produced on the stem and branches, but on the roots. Of this species Swanton remarks that: "the *Aphidæ* do not attack the green terminal part of the twig, but select a spot near to the old wood, where the formation of a periderm is indicated by the reddish-brown tint. Great activity of the cambial region immediately takes place, and overgrowth results. The soft parenchymatous tissue splits in dry weather and fungi enter, causing necrosis and ulceration, which the plant tries to heal by producing new cambial tissue. If this continues long, tumours attaining the size of a man's fist may arise."

#### (CURRANT BLISTER APHIDES.

Two species of gall-causing *Aphidæ* frequently cause injury to cultivated currants. That known as *Rhopalosiphum ribis* is often abundant from April to July, both on currant and gooseberry bushes; and occasionally entire crops of fruit are ruined by it. It lives beneath the leaves, and by constantly puncturing the under surface and sucking the sap causes red blister like swellings upon the upper surface. Eggs are laid in the autumn on the twigs. From these in the following spring, the young larvae—which are all females—hatch. They rapidly complete their metamorphosis, and when adult produce living young, which also are all females. Successive generations of viviparous females appear—some individuals being wingless, others winged and capable of migrating from one bush to another. The last generation of the season comprises both males and females—the latter laying the eggs which are destined to start the next year's attack. A closely allied insect called *Myzus ribis*, also causes galls on currant bushes. The leaves—especially those of the top shoots—curl up in a characteristic way, and the insects may be found sheltering in the folds. Whether this species also causes red blisters remains uncertain, as some authorities aver that it does, although Theobald says that he has

never been able to find any, except in association with *R. ribis*. It may be noted in passing that the rosy-hued blistering on apple leaves is caused by an insect called *Aphis sorbi*.

#### PAVILLIDÆ AND COCCIDÆ.

That wide-spread orchard pest, the apple-sucker (*Psylla sucker*) may quite properly be classed with gall insects, since when it attacks the foliage, it causes the leaves to become crinkled and deformed, and to take on a pallid—often also a frosted—appearance. But for a really striking Psyllid gall we must look elsewhere. One of the best examples, perhaps, is that found on leaves of the ash—usually only one-half of a leaflet being involved. This gall, which is caused by *Psyllopsis fraxini*, is formed by a thickening of the margin of the leaflet, which is loosely rolled inwards. The colour is greenish-yellow, tinted and streaked with red and purple. Another Psyllid gall that is likely to attract notice is found when *Psylla buxi* attacks the apical shoots of the box. The stunted and deformed leaves are bent into a hemispherical gall which resembles “a cabbage in miniature.” Swanton tells us that in Australia certain Coccids cause enormous galls on *Eucalyptus*, sometimes a foot in length. The few galls caused by British species, however, are all obscure. Indeed, probably the only one that is at all likely to attract the notice of the casual observer is that which may be found, not uncommonly, on the twigs of scrub oak. The female scale insect (*Asterodiaspis quercicola*) takes up a position on the twig, and remains permanently on one spot. Growth takes place around her, and in this way tiny pits are formed. These gall-pits and the insect which causes them are beautifully figured by Connold in his “British Oak Galls”; and in his description, this author tells us that “tits are extremely fond of the insects, and search most diligently for them.”

#### MITES AND THEIR GALLS.

The class Arachnida includes all the animals which may, by any stretch of the term, be called “spider-like.” Within this class we find an order termed Acari, which comprises two groups or sub-orders. One of these (*Acarina*) includes the typical mites and ticks, the other (*Vermiformia*) animals of more worm-like form. Many of these vermiform mites, which are all very minute, give rise to remarkable gall formations; and they are the only gall-causers in the whole class of spider-like animals. It is necessary to emphasise their smallness for (as Swanton observes) they are “often overlooked in the absence of microscopic examination for them.” Yet

sometimes the gall-formations with which they are associated attain to enormous size. Take for instance the well known "witches brooms" of the birch. The same authority says of these galls: "The majority of, if not all the brooms on birches in the south of England are caused by *E. rudis*, but it would appear that the fungus *Exoascus turgidus* is responsible in Scotland for these curious out-growths . . . . The beginning of a 'witch's broom' is a swollen bud. The axis of the shoot is seen to be pubescent in March, and yields mites in abundance late in the month if the weather is mild. The buds on afflicted shoots are shorter, more globose and open earlier than normal ones. The attraction of sap to the spot causes the development of an enormous number of twigs, which grow from a core which increases year by year. Some of the very large brooms seen on birches must be of many years duration."

There are about fifty British species of gall-causing mites, most of which belong to the genus called *Eriophyes*. (Plate IV. Fig. 1.) Some of these attack the leaf buds, *e.g.* *Eriophyes psilaspis* (yew), *E. avellanæ* (hazel) and *E. ribis* (currant). Others induce more or less conspicuous galls on the leaves, among which may be instanced *E. laevis* (alder), *E. pyri* (pear), *E. viburni* (mealy guelder rose), *E. macrorhynchus* (sycamore and maple), and *E. tilia* the familiar red "nail-galls" of the lime. The number of these galls carried by a single leaf is sometimes very remarkable. Speaking of the gall caused by *E. macrorhynchus*, Connold says that in 1899 he found a small maple bush in a hedge in Norfolk, and upon many leaves of average size he counted from 600 to 850 galls; one rather large leaf contained nearly 1400."

#### PECULIARITIES OF MITE-CAUSED GALLS.

Commenting upon the similarity between certain galls caused by flies and mites, Swanton remarks that the latter may nevertheless readily be distinguished by microscopic characters. "Mite-galls always have a hole leading into them; those caused by gall-gnats have no such opening." Indeed, many mites are very migratory in their habits, and some of the species are rarely found in the galls with which they are known to be associated. The abnormal hairiness of the attacked parts is another important character of mite-galls, which is rarely absent; but it cannot be regarded as an infallible test, since certain midge-galls, *e.g.*, those caused on the terminal leaves of germander speedwell by *Perrisia* (*Cecidomyia*) *veronicae* are clothed with very similar hairs. Still, it may be laid down as a fairly safe rule that wherever abnormal hairs occur, there one may expect to find mites.

## MITES ON PEAR.

Two kinds of mites are very apt to force themselves upon the notice of the horticulturist. These are the pear-leaf blister-mite (*Eriophyes pyri*) and the black-currant bud-mite (*E. ribis*). The two species, when examined under the microscope, are seen to be very like one another, although *E. pyri* is somewhat the longer in proportion to its bulk. It is white, sometimes with a pinkish tinge, and the average length of the female—which is larger than the male—is given as 0.2 mm. In this country the pear is chiefly affected; but in America the apple also is commonly attacked. Outside the orchard, several trees and shrubs (e.g. the mountain ash and the wild service tree) harbour the pest. Attack manifests itself on the leaves as small blister-like spots, which are at first red, then pale yellow or green, and finally black. Badly infested leaves fall off. The mites may also infest the fruitlets, which then develop small reddish pustules as soon as the blossom has fallen, or even before. The attacked fruitlets are either entirely destroyed, or—if they partially recover—produce stunted fruit. The mites pass the winter under the bud-scales, and enter the leaves through the stomata. The pest is spread with nursery stock, which should always be fumigated before being planted—hydrocyanic acid gas having proved quite effectual for this purpose. In small attacks, the galled leaves should be picked off and destroyed as soon as they appear. If this is done systematically for several seasons, the pest may be stamped out. For treatment on a large scale, spraying with lime-sulphur-caustic-soda wash is said to be most effective.

## THE “BIG BUD” MITE.

The notorious currant bud mite (*Eriophyes ribis*) (Plate IV, Fig. 2) lives in the buds of the black currant, causing them to swell, arresting their normal development, and giving rise to the disease known as “big bud.” The mite occasionally attacks the red currant also, though rarely. During recent years it has become one of the worst pests of the fruit garden. The damage done by it has been enormous, and up to the present no certain means of exterminating it has been found. Many of the attacked buds die right off, while of those which live very few produce fruit. The difference between normal and infested buds is usually well marked, even in winter, since the latter present a mealy and bloated appearance. As far as possible they

should be picked off and burnt, in the hope of keeping the pest in check. But badly infested plantations should be grubbed up and destroyed, and fruit stock other than black currants substituted. In making new plantations of black currant, only stock known to be free from "big bud" should be employed. The mites live and breed in the infested buds during the greater part of the year, but as the buds die they migrate to others. It is an interesting fact that certain mites, notably the present species, have the habit of assuming an erect position—standing on their tails, so to speak—and waiting patiently for the chance of "getting a lift" on some insect which may chance to settle near them, or to hover for a moment in the neighbourhood. After waiting erect and motionless for a while, the mites hurl themselves into space; and there can be no doubt that is this way many of them do effect a landing upon some unsuspecting "carrier," by whom they are conveyed in due course to "fresh fields and pastures new." It is certain that the infestation of food, etc., by mites is often brought about in this manner: viz., by the minute pests having been carried into larders, store-rooms, etc., in the first instance, by one or other of the various species of "house-flies."

#### GALL-CAUSING EELWORMS.

The minute creatures known as "eelworms" are members of the family *Anquillalidæ*, belonging to the order Nematoda, or thread-worms, of which Swanton remarks that "it would promote the happiness of the human race if these creatures were non-existent, for amongst them are some of the most dreaded of human parasites." The same author enumerates ten British species, several of which cause most remarkable nodosities and tumours on the plants which they attack. These include cultivated strawberries, cucumbers, tomatoes, beet, clover, various cereals, hops, several wild plants, grasses, hyacinths and seaweeds. The last-named plants are attacked by *Tylenchus fucicola*, while the allied species *T. devastatrix* is the eelworm—the wide-spread devastator of crops—to which the Ministry of Agriculture devotes its Leaflet No. 46. This is the "stem eelworm" which by invading the tissues of the plants, causes the diseases known popularly as "tulip root" or "legging" in oats, and "clover sickness." The worms are exceedingly small—not more than the one-twenty-fifth part of an inch long when full grown. Swanton says "the larvæ bore into the rootlets and become stationary. The adult female emerges from the plant, and is

joined by the larger male, which bores its way out later. After fertilization the female degenerates, and at last is nothing more than a broad pouch containing ova and larvæ; the majority of the ova hatch out within the body of the parent. There are six or seven generations in one year." It is stated that the larvæ have the power of resuming animation and active life after they have remained in a perfectly dry condition, in dead tissues or dry soil, for two or three years. This pest is a very difficult one to cope with. A rotation of crops should be selected that will allow as long an interval as possible between two crops of the same kind, since some plants are far less liable to suffer from eelworms than others, while a few seem to be practically immune. Deep ploughing is advisable; and as far as possible all refuse from infested crops should be burnt.

#### THE ROOT KNOT EELWORM.

An eelworm of another genus causes galls on the roots of certain plants, notably on cucumber and tomatoes. This is the "root-knot eelworm" (*Heterodera radicola*), dealt with in leaflet No. 75, issued by the Ministry of Agriculture. The first symptoms of attack is the drooping and yellowing of the foliage. The stem then becomes limp, and a collapse of the whole plant follows. If the roots of an infested plant are examined, the finer branches will be found to be more or less studded with swollen portions—the "knots" or galls—varying in size up to one-quarter of an inch across, while much larger swellings are often present on the thicker branches of the root. These deformities are caused by the presence of the eelworms in the tissues. In them the females lay their eggs. The young eelworms (which are only the one-seventy-fifth part of an inch long) leave the galls and make their way through the soil, to other parts of the root, or to the roots of other plants. The root-knot eelworm is especially destructive in glass-houses. The only certain way of destroying it is to heat the soil to a temperature of 180°; while pots, crocks—indeed, the whole surroundings of places in which infected plants have been growing—should be thoroughly disinfected. Soaking the soil with formalin (1 part in 200 of water) will kill most of the pests, but it is not absolutely effective.

The two eelworms of the strawberry are known as *Aphelenchus fragariae* and *A. ormerodis*. They cause remarkable enlargements and fasciations of the stems. Several other species besides those named above infest cultivated plants, but only one of these—*Tylenchus tritici*—can be mentioned here. This one deforms the



marsh bent grass, but it is also liable to attack wheat, giving rise to roundish growths resembling "purplish or dark-coloured peppercorns in the ear." Fortunately it rarely occurs in sufficient numbers to be a serious pest; but that it has great latent powers may be gathered from Dr. Bastian's note that it is capable of remaining dormant for twenty-seven years, and then resuming its wonted activity!

#### GALLS CAUSED BY FUNGI.

Fungi are organisms in which the true tissues of the higher plants are replaced by intertwining threads known as "hyphæ." Fungi also lack chlorophyll, and are thus unable to nourish themselves after the manner of green plants. Hence the majority are definitely either saprophytes or parasites; that it is say, the former flourish on dead organic matter, such as rotting wood, humus, etc., while the latter feed on the living substance of animals or plants. It is among the fungi which attack living plants, that we find the true gall-causers. Considerations of space will prevent us from mentioning more than a few of these. We have already seen that in Scotland a fungus seems to be the cause of most of the growths known as "witches' brooms," which occur on birches. Similar masses of twigs on the silver firs have been ascertained to be due to the attack of another fungus, viz., *Peridermium elatinum*, which in one of its forms, occurs on the chickweeds. Not a few parasitic fungi grow on different host plants during the various periods of the life-cycle; a state of things which is referred to as "heteroecious." A good instance of this, in which both the forms of the fungus cause gall-structures, is *Gymnosporangium clavariaeforme*—the cause of the disease known as "pear leaf cluster cups." In spring the fungus forms yellow, gelatinous, horn-like fruits on swollen branches of the common juniper. The spores produced here, if they chance to fall upon damp young pear leaves, germinate and give rise to thickened reddish-yellow spots, with small horn-like processes projecting from the under surface of the leaf. These gall-structures give rise to the fruits of the second form of the fungus, which is found occasionally on the stems and fruit as well as the leaves, and is often very destructive, since it causes the foliage to fall early, and thus check the growth of the crop and the ripening of the young wood. It also attacks the leaves, stems and fruit of the common hawthorn, and other species of *Crataegus*. If the diseased branches of the juniper are removed the attack on pears is prevented, for it is the spores produced on the juniper that infect the pear.

## PEACH LEAF CURL AND BLADDER PLUMS.

Two species of fungus belonging to the genus *Exoascus* are well known to fruit growers. The first and commoner of these, attacks the peach, with the result that the leaves become much curled and puckered, and are at first pale greenish yellow, often becoming later a pretty rosy red. Young infested shoots are swollen and twisted or curved ; and the internodes are abnormally short. The diseased leaves soon fall, and a second crop is produced about midsummer. The strain thus imposed upon the tree results in the dropping of the fruit at an early stage in its development. In the case of nursery stock, consecutive attacks for three or four years usually kill the tree, or so stunt it that it is rendered practically worthless. The disease may be kept in check by spraying with Burgundy mixture in February.

“ Bladder plums ” are also caused by a species of *Exoascus*, the mycelium of which lives from year to year in the branches. From the branch it spreads up the young shoots, invades the flower, and attacks the young fruit, which in consequence increases abnormally in size, becomes dry, distorted and hollow, lacking a kernel or stone. The spores of the fungus appear as a delicate white bloom in July. As the mycelium does not spread backwards in the branch, persistent pruning of all the branches showing signs of infestation checks the spread of the fungus, and should eventually eradicate it. It must not be forgotten, however, that *Exoascus pruni* is found on wild species of *Prunus*, and that cultivated trees are always liable to be infected from this source.

## WHITE RUST OF CABBAGE.

A fungus called *Cystopus candidus* attacks certain Cruciferous wild plants, and sometimes invades the garden, where it is known as the “ white rust of cabbage.” It has a world-wide distribution. On cabbage leaves, it forms snow-white polished patches, which are often grouped in irregular concentric rings ; while the leaf stalk may be much hypertrophied. Similar malformations occur when the stem and flower-heads are attacked ; and in the swollen pores innumerable resting spores are developed, which germinate and infect seedlings during the following season. Diseased leaves should be removed and destroyed as soon as they are noticed ; but the most important preventive measure is to collect and burn all swollen and contorted stems and flower-heads. Among wild plants, the common shepherd’s purse often suffers very seriously from the attacks of this pest ; hence, this weed should be carefully suppressed in the neighbourhood of cultivated land.

## WART DISEASE OF POTATO.

Many gall-causing fungi are dreaded pests, not without reason ; but probably no species in this country, at the present time, is more to be feared than *Synchytrium endobioticum*—the fungus which, when it invades the potato, gives rise to the disease known popularly as “wart” or “black scab.” So far the efforts which have been put forth to check the spread of this pest have proved by no means as successful as could be wished. It is not easily discovered before the harvest, although the haulms sometimes show swellings, especially near the surface of the ground. When the crop is lifted, small wart-like galls, whitish, or the same colour as the tuber itself, may be noticed in the “eyes.” This is an early stage of attack. As time goes on the galls or warts run together, and form irregular spongy masses, which later become dark-coloured. Similar gall-structures occur on the roots, and on the lower parts of the haulm. In bad attacks the tubers rot and a dark evil-smelling liquid oozes from them. For further particulars concerning the life-cycle of this dire fungus, and for instructions as to the precautions which should be adopted when an outbreak occurs, the reader is referred to the Ministry of Agriculture’s Leaflet No. 105.

## FINGER AND TOE DISEASE.

The disease of turnips, swedes, cabbages and other cruciferous plants which is known popularly as “finger and toe” is a good example of gall-formation caused by one of those lowly organisms, the Mycetoza, fungus-animals, or slime-fungi, as they are sometimes called. It usually attacks the roots, giving rise thereon to nodular or warty outgrowths ; sometimes the whole root is swollen, clubbed and distorted. The scientific name of the pest is *Plasmodiophora brassicæ*. It is practically unknown in soils which contain a large percentage of lime, and the application in autumn of burnt lime to the soil (at the rate of four tons to the acre), is the most effective preventive measure known. The disease is extremely infectious, and when it makes its appearance no trouble or expense should be spared to stamp it out. It is suggested that on land known to be infected no cruciferous crop should be grown for a period of seven or eight years. All infected refuse should be burnt, and care should be taken that no tainted dung is brought on to land. Unfortunately, cruciferous weeds are attacked by this fungus and help to spread it. For this reason every effort should be made to eradicate them.

## BENEFICIAL GALL-CAUSING FUNGI.

Usually a parasitic fungus lives at the expense of its host, and confers no benefit in return. There are, however, certain cases in which a kind of give-and-take arrangement, known technically as symbiosis or mutualism, exists between the parasite and its host. Swanton gives some instances in which the presence of a parasitic fungus results in increased seed-production by the host. Species of bacteria (*Pseudomonas*) cause nodule-like galls on the rootlets of leguminous plants, including the cultivated clovers, and by their presence "fix" free nitrogen, thus enabling the host plants to avail themselves of this much-needed chemical. The precise manner in which this happens is well described by Step, who says the "little nodules, which any one can find for himself if he digs up a clover or a vetch, gradually become full of bacterial remains, all rich in nitrates which the plant can utilize for its own purposes." The same kind of service seems to be rendered to alders by a lowly organism (a hyphomycete) known as *Frankiella alni*. (Plate IV, Fig. 3.) According to Swanton, "Hiltner proved experimentally in 1897 that these tubercles (on the roots of the alder) enable the plant to assimilate the free nitrogen of the air by a process resembling that which occurs in leguminous plants, and showed that alder plants can grow without tubercles if nitrogen is present in the soil, that the production of tubercles is hindered if nitrogen is present in abundance, and that calcium nitrate stopped their growth entirely."

## AN UNDETERMINED GALL.

In conclusion, reference may be made to certain conspicuous swellings—apparently gall-formations—which are of frequent occurrence on the branches and stems of trees. These sometimes attain to enormous dimensions. In the case of the oak, Connold refers them definitely to the action of the fungus *Dichaena quercina*; but there appears to be much room for doubt as to the correctness of this diagnosis. Swanton says that he has "never observed a fungus upon these hypertrophies." He goes on to refer to a considerable collection of wood tumours in the Haselmeme Museum, and add that in no instance is it possible to state with confidence the primary cause of the overgrowth. "It may have resulted from mechanical injury to a bud, from insect or fungus irritation, or from the presence of a bacterium." There remains another possible explanation, which is at least worthy of careful investigation, viz., that the pathological condition may be wholly intrinsic in its origin.

The process of cell-division goes on during the whole life-spells of plants and animals alike. In the healthy organism there is a perfect adjustment of supply to demand ; but in the malady called cancer, which afflicts many animals as well as man, it would seem that some kind of controlling factor is withdrawn, with the result that masses of superfluous tissue are formed, sometimes with great rapidity, thus bringing disease and death upon the organism. One is tempted to wonder whether the true explanation of these undetermined gall-like swellings on trees may not lie along this line of thought.

---

## V.—THE FOREST OF DEAN.

*Contributed by the Right Hon. F. D. Acland on behalf of the Forestry Commission.*

The tract of country known as the Forest of Dean lies between the Rivers Severn and Wye, the nearest towns being Gloucester on the east, Ross on the north, Monmouth on the west, and Lydney on the south.

The total area of Crown Lands in the Forest of Dean proper is about 18,700 acres, which is made up as follows : Waste land under woods, 15,184 acres ; crown freeholds (mostly under woods), 680 acres ; waste land let for mining or railway purposes, 765 acres, and unenclosed waste not appropriated for any special purpose, about 2,071 acres. Outside the Forest of Dean proper, under the management of the Officer (Deputy Surveyor), who has local charge, are Abbotswood (623 acres), Highmeadow Woods (3,350 acres), and the Clearwell Woods (300 acres), making a total of, approximately, 23,000 acres. Of this 23,000 acres 19,000 are being brought under systematic forest management.

There are three main valleys running north and south, with intervening ridges and plateaux, and the range of elevation is from 65—900 feet above sea level.

The coal measures occupy the greater part of the area, and the remainder is divided between old red sandstone and carboniferous limestone. The soil of the coal measures is loam overlying sandstone or clay, according to locality. The soil overlying the old red sandstone and limestone is light loam and excellently suited for timber production. The average rainfall is about 33 inches, and it is well distributed throughout the year. Late frosts and, to a minor

degree, wind, cause a certain amount of damage to trees, but the former do far the more harm of the two, as in recent years there have been frosts as late as June.

#### HISTORICAL NOTE.

The origin of the Forest as a forest is unknown, and dates to pre-Norman times. Like all the Royal Forests its original use was as a hunting preserve for the King. Its history, from a timber production point of view, dates from the Statute of 1668, which empowered the Crown to enclose commonable waste of the Forest of Dean for the purpose of the growth of timber, provided that the total area enclosed should not at any time exceed 11,000 acres. Such areas, while enclosed, were to be freed from common rights, and, when the trees were grown beyond risk of damage, enclosures might be thrown open and an equivalent area enclosed elsewhere.

The purpose of this legislation was to build up a supply of oak for the Royal Navy, as it was feared at that time that the increasing scarcity of suitable oak for ship-building might have a very serious effect on Naval policy.

It is interesting to note that in the neighbourhood of Speech House Hotel, in the middle of the forest, some of these large oaks date from the period immediately following the Act of 1668. In 1788 the Commissioners appointed to enquire into the state of the Crown Woods reported that the Forest was probably at its best at the beginning of the 18th Century, but, in the meantime, all care appeared to have ceased, and the enclosures at that time only amounted to 675 acres. In consequence of this state of affairs a further Act was passed in 1808 substantially re-enacting that of 1668. The Act recited that the Act of 1668 had "not been duly put in Execution" and that "from the great and increasing Difficulty of procuring a Supply of Timber from Foreign Countries. and from the Estates of private Individuals in the United Kingdom for the use of the Navy it has become necessary to adopt measures for insuring a more adequate Supply of Timber in this Kingdom." In 1810 the work of reorganisation began, and more than half of the oak woods which are now to be seen in the forest were planted within the succeeding twenty years or so.

From 1808–1853 no less than £134,000 was received from thinnings with the result that the woods, which to begin with had not been properly planted, were completely overthinned: another big mistake was the omission to underplant the oak with beech. These two mistakes have resulted in shortboled, branchy oaks and soil

insufficiently canopied to retain its full productive power. If beech had been planted the falling beech leaves would have enriched the soil and the oaks would have grown up straight among them.

From 1842-1847 about 2,040 acres were enclosed and planted to take the place of enclosures thrown open. But interest in the sylvicultural work in the Forest subsided with the introduction of iron into ship-building, and it was not until 1896 that the state of the Forest was again investigated and interest directed to its timber producing possibilities.

Under the direction of the late Sir Stafford Howard a vigorous policy of replanting the unsatisfactory oak woods with conifers was begun, and up to the beginning of the war some 2,000 acres had been felled and replanted in this way.

#### PRESENT METHOD OF WORKING.

The Forest is being worked on the assumption that ultimately some 4,800 acres of the land best suited for the purpose will be used for growing oak, and the remainder, with the exception of 200 acres for poplar, will be used for conifers or ash. The oak is being cut and regenerated as far as possible by self sowing at the average rate of about 38 acres per annum. The conifer and ash is being clear-cut and replanted at the rate of about 225 acres per annum; the conifers planted are one of the following: Larch, Norway Spruce, Corsican Pine, Douglas Fir, Sitka Spruce and Thuya. The first three are planted with an admixture of beech, but otherwise pure. Douglas Fir is either planted pure or mixed with Sitka or Thuya. The trees are usually planted 5 feet apart except in the case of Norway Spruce which is planted  $4\frac{1}{2}$  feet apart. Corsican Pine is planted on the most wind swept ridges and in the poorest soils. Douglas Fir in the more sheltered but not too frosty localities, Spruce generally in the wetter and more frosty places, Larch on the upper slopes where late frost is not to be feared and where it is not so exposed or the soil so poor that Corsican Pine should be planted. Ash is planted instead of conifers where the locality is thoroughly suited to ash, that is in deep moist-soiled sheltered areas where late frost is not to be feared.

In the areas kept permanently for oak, when regeneration from seed naturally fallen is not complete or impossible, oak is planted mixed with larch, the larch being used as nurses for the oak. The larch is removed from time to time as required until at about the forty-fifth year no larch remains: when the last of the larch are removed the young oak wood is underplanted with beech. Poplar is planted 12 feet apart.

## EMPLOYMENT.

The work of felling, replanting and hauling timber gives employment in all the woods, including Highmeadow, to some 190 men in addition to whom there are 17 foresters of various grades employed for supervisory purposes. Conversion of the timber is done partly in the Crown Saw Mill at Parkend, and partly in private mills, and it is estimated that further employment is thus given to about 65 men.

It is estimated that when the forest is in full working order and properly stocked the annual out-turn in timber and firewood will be about four times what it is at present and that the number of men employed will be about 400 to 450 for tending and working the woods, including timber hauling. It is not possible to forecast how many more hands will be employed on converting the timber into articles of general utility from toys to paper pulp; on the Continent there are many more labourers employed on such conversion work than on the work of forestry proper, but situated as is the Forest of Dean much of the timber of the medium and smaller sizes will in all probability go to the coal fields as pit props, and one cannot therefore predict how much labour will be required for working up the timber. The forest will, however, have a fairly large annual yield from beech in the future and this will probably be used for toys, chairs, etc., and not for the mines, as this timber is not very suitable for pit props. An important point is that when a sustained annual yield of timber of any kind is assured, as it will be in the Dean, then it is worth while for a company to consider the starting of a factory to work up that product, thus in the case of an assured and sufficient annual yield of beech a chair factory might be started.

## THE FOREST COMPARED WITH ITS USE FOR AGRICULTURAL PURPOSES.

The Forest forms one of the few remaining reserve of oak timber in the United Kingdom, and it is essential that part of it should be maintained for that purpose. Consequently there is a certain amount of land in the forest at present under timber, which could, if it were a remunerative process, be used for arable purposes. It is, however, dedicated for use as a forest, and the possibility of combining agriculture with forestry on the same soil is small. The woodland areas, which are not enclosed in their present condition, give a certain amount of grazing and shelter for sheep and other animals, but it is not possible to admit sheep into enclosures which are being replanted without risk of serious damage to the young trees.



The return of timber from the forest is at present small owing to the way in which the woods were treated during the 19th Century. During the next ten years on an average some 200,000 cubic feet of timber logs, 100,000 cubic feet of pitwood, and 150,000 cubic feet of firewood, or 450,000 cubic feet in all will be obtained per year.

Under proper silviculture the area set aside for oak should yield about 65 cubic feet, per acre per annum and the coniferous areas 100 to 110, that is to say an annual out-turn of about one and threequarter million cubic feet of timber and firewood should be obtained from the whole area when it is properly stocked.

#### POINTS OF INTEREST.

The usual stopping place for visitors in the Forest is at Speech House Hotel. In the neighbourhood of the hotel there are numerous old oaks dating from the time of Charles II., and in Beechenhurst Enclosure, immediately facing the hotel and after passing through a belt of 100 year old oak, are young plantations planted at different times during the last twenty years on the site of inferior oak woods. Descending the hill to Speech House Road Station a view may be obtained on the left of an uneven-aged 80 to 100 year old oak wood which is being converted to a coniferous wood. The conversion of this 1,000 acre wood will take 60 years from the time it started, five years ago. The woods are felled and replanted in successive strips which proceed from the north-east to south-west, and although the fellings are annual it is so arranged that four years elapse before a felling takes place adjoining a previous felling; this is on account of the advisability of sheltering the newly planted trees till they have established themselves. Douglas Fir with Thuya or Sitka is being planted on the lower and middle slopes, and Larch with Beech mixture on the upper slopes.

Directly after crossing the railway the wood distillery is to be seen on the left, and beyond this, on the left and right as we ascend the hill to Coleford, are 100 to 110 year-old oak woods, which are being reserved for permanent oak production. In both of these woods near the road clear fellings in strips or groups and subsequent natural regeneration has been started; it is worth going to see the strip of naturally regenerated oak in the wood on the right as it is exceedingly good and came from 1914 acorns. It will be noticed that on part of this strip larch has been planted experimentally as nurses to the oak.

At the top of the hill on the left is a poor 60-year-old oak wood underplanted with beech: this wood will be converted to conifer as it is too exposed for oak.

## SPEECH HOUSE TO RUSPIDGE, SOUDLY AND BLAKENEY.

Going along the high road after about 400 yards an opening is to be seen on the left with a cottage by it ; this is a forest nursery of about six acres for rearing trees ; there are some 30 acres of these nurseries in different parts of the woods supplying not only the needs of the forest but part of the planting requirements in other parts of England and Wales. After leaving the nursery we soon come to a house on the left, near to the road. The felling and conversion to conifer, of the oaks woods adjoining this house have been begun, the two first areas to be felled being close to the house ; Douglas Fir and Sitka Spruce are being planted here except along the railway, where on account of the danger from fire, a belt of Sweet Chestnut will take the place of the conifers.

As we proceed down the hill to Ruspidge Station a very poorly grown oak wood is to be seen on the left : this will be converted to conifer within the next 20 years, a start being made next year, when it will be enclosed for the purpose. Proceeding from Ruspidge to Soudly a promising plantation of Douglas Fir and Thuya on the lower slopes and Larch and Beech on the upper slopes is seen on the right just before we cross the stream before entering Soudly ; this plantation was made in 1915-16 and another strip of the same wood was felled last year and is now being planted up with the same species in its turn ; in another four years the next adjoining strip will be felled and planted and so on.

As we go into and pass through Soudly the Abbotswood woods of between 600 and 700 acres are on our left and certain interesting young conifer woods of all ages up to 15 years ; much of this forest consisted of self-sown birch, which it was necessary to replace with more valuable conifers or ash ; this is being done at the rate of about 12 acres a year and should be completed in 15 years. There are about seventy interesting experimental plantations to be seen in this area. These experiments are made chiefly in order to test different coniferous mixtures.

After leaving Soudly for Blakeney it is well worth noticing a wood close to the road on the right which was planted with oak and larch in 1872. The treatment of this wood has been excellent and the oak is in very good condition. The last of the larch were removed when the plantation was between 40 and 50 years old, and the oak was then (in 1913) underplanted with beech as it should have been : the larger beech were not planted, but came in naturally from seed from some old beech which were left standing when the wood was planted up.

## BLAKENEY TO PARKEND.

After leaving Blakeney there is an interesting wood on the right to the east of the railway. This wood was felled between the years 1900 and 1913, and the oak is mostly naturally regenerated from seed.

At the northwest end of this wood is an old Roman Road part of which, within a hundred yards of the high road, is wonderfully preserved. As we proceed towards Parkend we see on the right a large area of wood in process of conversion to conifer; this conversion will be complete in 15 years time. As we get near the top of the hill, before going down to Parkend, an oak wood about 60 years old and under planted with beech is to be seen on the left. As we go down the hill to Parkend more of this same wood is to be seen, but parts of it have had to be felled and replanted with conifers on account of its very poor condition. The whole of this wood will eventually be in the coniferous area.

---

## VI.—MODERN DEVELOPMENTS IN FARM TRACTORS.

*By H. E. Garner (Author of "Efficient Tractor Driving.")*

## I.

Tractors of one kind and another have been used for various purposes since the early days of "Steam-power." In hauling loads along roads, in driving machinery of different kinds, the steam tractor or traction engine, as it is often termed, has been and is a familiar and appreciated power-unit to many sections of the community. In Agriculture, threshing and ploughing have been accomplished by means of traction engines for more than half a century.

The farm tractor, however, is of more recent origin. It is distinguished from the traction engine, mainly in the fact that it directly hauls implements used in cultivating and harvesting over the fields after the manner of a horse. The traction engine, of course, supplies the power necessary for such haulage as a stationary unit for the greater part, winding and unwinding steel cables on drums when so used.

In this country, Saundersons, of Bedford, probably, were the pioneers in farm tractors. In America, the Hart-Parr Company claim the distinction. In general, developments have proceeded with the advance of motor engineering, and within the last four

years this country has witnessed many developments in farm tractors, so that to-day what is practically a new industry has been established. An attempt is made in the following sections to present the modern developments in detail, both from an engineering and farming standpoint, and also to summarise their import, in the writer's opinion, to the agricultural community.

## II.

Among the most striking of modern developments in farm tractors is the increase of types. Since the wholesale introduction of tractors during the war, under the auspices of the Food Production Department of the Board of Agriculture, almost every month a new make of machine has been put upon the market. In some cases only alterations in the details of construction and design of known models have been represented, in others, entirely new types or varieties have been produced.

The combined outfit, or motor-plough, as it is commonly termed, which was introduced earlier to the farming community in the Wyles and Moline, has been developed considerably. With the Martin motor-plough, self laying tracks are the means for locomotion. In all other makes, the wheeled type has been adhered to, and the line of development taken that of making the outfit more adaptable for work other than ploughing. Indeed, with one exception, all these combinations are now equipped for stationary work by means of a pulley.

Another development along the lines of the combined outfit is represented by the Time aver tractor. This is a one-way motor-plough. Two sets of three bottoms each are coupled to extensions for and aft the power unit to achieve the end. They reduce to a minimum the headland, and cut out, of course, all headland work. It is claimed by the makers of this outfit that a conversion to a four wheeled tractor can be made in half-an-hour, presumably by two men. However this may be, the model strikes a new note in tractor building, which may be capable of great development.

By far the largest number of new machines, however, have been of the wheeled variety. In this class the power-unit, or tractor, is distinct from the load it hauls. Judging from the numerous models marketed recently, and the machines in use, the four-wheeled type meets with the greatest favour among farmers. The note sounded in the construction of the early Wallis and definitely struck by the Fordson, has been followed by many makers of tractors. In fact, what is known as "unit" construction, dispensing with a frame-

work of channel section steel, has become a feature exclusively of tractor engineering. The Austin, Fiat, Glasgow, and New Samson are notable examples of the practice in recent models. Again, the "lightweight" tractor, of which the Fordson was the forerunner, has found a number of imitations.

Of additions to the three-wheeled class of tractors there are only a few. The Glasgow, Gray, Commonsense and Chase (Plate I, Fig. 1)—a Canadian production—complete the list. The Chase has two driving wheels at the rear and a single steering wheel in front, the others have two front wheels and one rear wheel. The Glasgow (Plate I, Fig. 2) embodies special features in drive, and in adjustment of the front wheels so that the machine can be kept in an upright position when running with the off-side front wheel in the furrow. The same effect is secured in a different way with the Commonsense. No serious attempt, apparently, is being made to demonstrate the utility of the novel features embodied in the Gray.

In the self-laying track class, exemplified by the Clayton and Burford, only one addition has to be recorded. It is of considerable note, however. Made by Blackstone, it is motived by an oil engine, and reveals other features of interest. In many ways it marks an entirely new departure in tractor engineering, and is fitted as both a track and a wheeled machine.

Apart from full size farm tractors, or machines capable of hauling from two to four furrow ploughs, a large number of smaller machines have been produced. The Beeman, probably, was the earliest example of these two-wheeled units for coupling to various implements used in fruit orchards, market gardens and sports grounds. A rotary cultivator along the same lines is another addition to this class. While a more ambitious attempt to provide a serviceable one-furrow tractor is represented by the Oldsmar, exhibited for the first time in this country at the Royal Show at Darlington.

### III.

Such is a general survey of the broad developments in farm tractors during the past four years. More complicated to the lay mind, but nevertheless equally important are the changes in detail of design and construction during the same period. No attempt will be made to follow these in their sequence of development, but the general tendencies in motor and transmission will be briefly outlined.

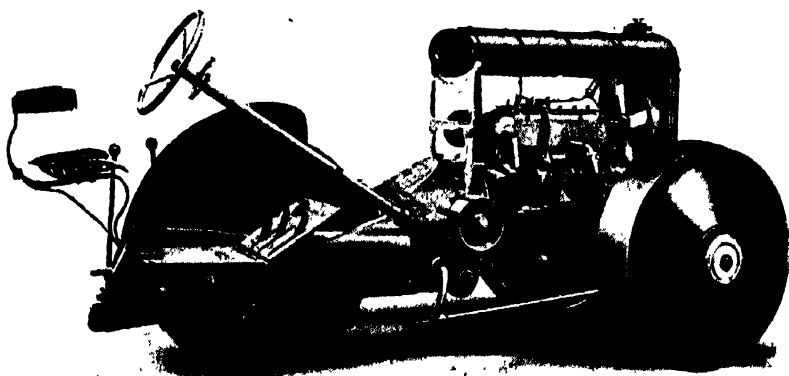
Without doubt the four-cycle, four cylinder high speed internal combustion engine is the rule with most new models. The only

PLATE I.

Fig. 1.



THE CHASE TRACTOR.

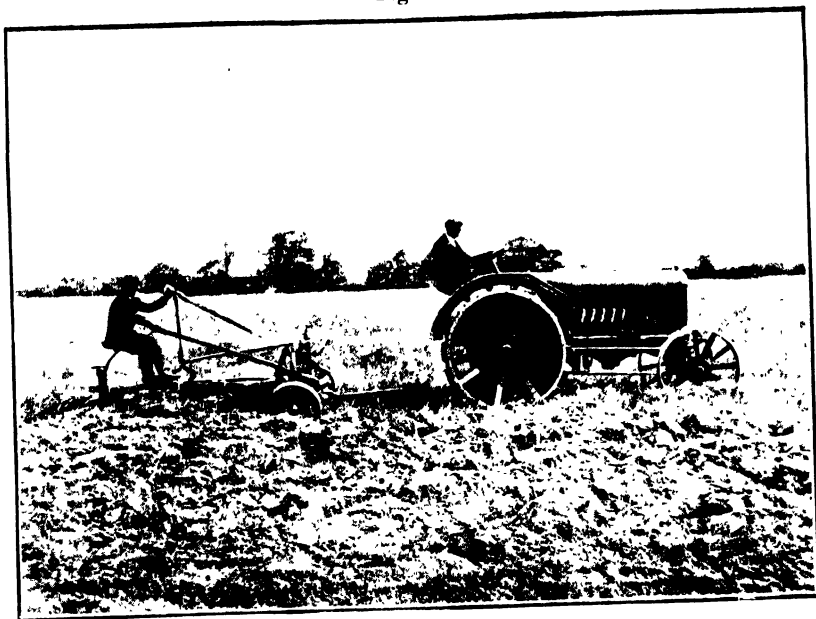


THE GLASGOW TRACTOR.



PLATE II.

Fig. 1.



THE PETERBORO' TRACTOR.

Fig. 2.



THE "FORDSON AND OLIVER" TRACTOR.





notable exceptions are the Avery with six cylinders side by side, and the Commonsense with its two sets of four cylinders each, set V wise. Removable cylinder heads have become a standard fitting and overhead valves are on the increase. More and more is a robust type of construction being adopted in regard to connecting-rods, crankshafts and bearings. Water-cooling assisted by a centrifugal pump and deep jacketing, is practically universal. Forced feed lubrication is increasingly arranged for. Magneto ignition, aided by an impulse starter, is the rule. A great deal more attention is being given by designers of tractors to the accessibility of parts, for purposes of both repairing and operating. The position of the radiator in the International Junior at the rear of the engine is a good example of this. The problem of partially vaporised paraffin has been attacked in the construction of the Peterboro tractor—the latest British model—by means of a collecting duct beneath the cylinder bores. In all recent models, the system of governing the engine to a mean working speed has been adopted.

In clutches there have been no striking departures. On the whole the types adopted follow motor car and truck practice. The Cone type predominates. Metal to metal, running dry and in oil, finds some followers, while the expanding shoe, contracting band, and floating Ferodo ring are fitted in some recent additions to the Tractor world.

Most new models are characterised by a wholly enclosed transmission system. The features is made possible, of course, by the unit construction. Meshing gears are being reduced to a minimum and bevel gears are being avoided whenever possible. Case hardening of all gears is now the invariable practice, while roller and ball bearings are rapidly displacing the plain type. A friction drive, dispensing with clutch and ordinary gears, has been adopted in the G.O. tractor.

No marked tendency is apparent in final drives. Worm, spur gears, chains and bull pinions meshing with Master gears on the rear wheels are features of very old and very recent models. The first two types are wholly enclosed, and, perhaps, in closest touch with modern lines of development. Several models are now constructed without differential gears, the turning effort being obtained by means of disengaging “dog” clutches or similar devices. With rear and front axles and wheels there are no notable departures from familiar practice in early models of farm tractors.

A considerable contribution, however, to the solution of the problem of traction with tractors has been made in the Garner detachable spuds. These reduce to a minimum the time spent in

equipping wheels for road or field work. Again, progress has been made in constructing rubber pads and studs for use on tractors when hauling along highways.

In only a few cases has any attempt been made to equip a tractor as an efficient unit for stationary work. It is true that greater attention has been paid, in many recent models, to the position and accessibility of the pulley and the set of the machine when driving ; but the Fiat is an outstanding example of taking the matter a step further, with a well-placed, variable speeded pulley.

Modern models of farm tractors as a whole, reveal a great deal more attention to detail than was formerly the case. In most instances, fittings are provided for screening water, air, and fuel. The magneto is protected. Controls are within easy reach of the driving seat. Adequate guards are furnished as a protection against mud and dust. The discharge of the exhaust is better placed. Rivets replace bolts and nuts wherever possible. Finally, greater thought has been bestowed as to the position, height and adaptability of the drawbar.

#### IV.

The most marked development in operating farm tractors is represented by the almost universal practice of running the off-side wheels in the furrow when ploughing. From the farming point of view this has advantages and disadvantages, but the fact that it simplifies the problems of coupling and driving outweigh all objections. The practice, however, furnishes new problems for tractor engineers to solve in the case of four-wheeled machines fitted with differential gears. The Glasgow is a good example of an attempt to meet the altered conditions along original lines with a three-wheeled machine.

The one-man outfit is another feature of modern developments in operating. It has effected the replacement of the riding plough for the self-lift type and brought about a similar change with other implements. The labour question has been thereby simplified. But a considerable deterioration in the quality of tractor cultivation has been the immediate effect. On fields that are comparatively flat, the self-lift implements will do satisfactory work when suitably fitted and where the plough and tractor maker have co-operated closely. But on hilly fields and across slopes, ploughing of even width and depth are difficult achievements with a self-lift implement, and increasingly difficult as the number of bottoms increases. The tendency to make ploughs of lighter draught and weight increases rather than diminishes the difficulties of operating the self-lift implement.

Undoubtedly the tendency is towards ownership of outfits rather than hire. To many, in view of the complicated nature of a modern tractor, this seems rather a remarkable development and one difficult to account for. Modern outfits require more and more skilled handling to obtain economical and efficient results. Yet in most parts of the country, contractors appear to make little or no headway. It is true that there are notable exceptions, and the success of the Bois Hall Tractor School in contracting for ploughing and cultivating with farm tractors in Essex is an outstanding example of what can be done in this direction by means of skilled handling, backed by an efficient organization.

The education of the farming community in the operating of power-units for purposes of agriculture proceeds apace. The specialist schools and businesses in various parts of the country that undertake this work are on the increase. The established Agricultural Colleges are giving more and more attention to this aspect of education. The rapid development in the use of the motor cycle and car is a big factor in the spread of knowledge of modern motor engineering in rural and urban districts. The educative influence of part of the agricultural press is a factor of importance. More and more, townsmen familiar with power machinery are being attracted to the farm by the tractor.

## V.

Another interesting feature in the development of farm tractors in this country has been the inauguration of annual trials. Last year at Carlton near Lincoln, the first of these was held under the auspices of the Society of Motor Manufacturers and Traders, and this year the second of these public demonstrations was carried out at Aisthorpe, some six miles from Lincoln, under the supervision and arrangement of the Royal Agricultural Society of England, assisted by the Society of Motor Manufacturers and Traders.

Previous to these trials, any tests that were made on tractors were done wholly at the maker's works or on land hired by or loaned to them for demonstration purposes. Although reputable makers were extremely careful in making claims for their machines well within the limits of their powers, it was inevitable, in the course of marketing that the merits of a particular machine should be somewhat exaggerated. It was partly with the object of obtaining an independent record of what different makes of tractors could do under certain conditions that the trials were promoted.

In the 1919 Trials a dynamometer test of the hauling capacity of

each Tractor on wet clay soil was taken by an improvised but fairly effective method. Three days ploughing followed on heavy and medium soils in flat fields. Road hauling tests up steep gradients were made, and a Threshing trial was carried out with most machines. The results of these trials were published in book form some considerable time after the event, and although the reports and statistics gave rise to all sorts of claims and controversies by makers, undoubtedly a basis was furnished on which to build. It must be remembered that the 1919 Trials were the first attempt of the kind in this country, and the weaknesses revealed were to be expected. A very large number of farmers attended the demonstrations.

The main development in the 1920 Trials, as compared with those of the previous year, was the classification of tractors according to their rated horse-power, and the introduction of a competitive element. Other changes were the adoption of the Ransome and Hornsby ploughs for use with all machines up to 30 horse power, an innovation that led to a great deal of friction between some makers and the organizers. Ploughing tests on side slopes and gradients were instituted. The hauling and Belt tests also took a slightly different form. The details of the changes and the performances of entrants can be clearly visualised from a comparison of the published reports.

The value of these public tests is considerable. In effect, they reveal what can be done with a specially tuned tractor by an expert operator. Indeed, they can be viewed as a practical demonstration in the handling of farm tractor outfits. Only to a limited extent, however, are the trials a test of reliability. The history of a particular make of machine, its record of service under normal conditions of running and handling must be taken into account when estimating the worth of any farm tractor.

## VI.

Perhaps the outstanding feature of modern developments in farm tractor is the "lightweight." Its introduction not only marked a definite departure from earlier practice, along traction and gas engine lines, but it also left behind the attempts to adapt Motor Truck practice to the purposes of Agriculture. By itself it has done a great deal in the direction of countering the stresses due to irregularity of running track, and when coupled with unit construction, has gone far towards making them of little consequence. The objection that the "lightweight" tractor must obtain its traction by means of speed has little or no point in the light of

experience, while the more satisfactory working of a two furrow self-lift plough over a three or four furrow is an additional point in its favour. Provided high quality material is used throughout the construction, there are few obvious advantages in weight, while, from a farming standpoint, there are enormous advantages from lightweights. The reversion to the medium and heavy-weight tractors, which is reported as taking place in America, is probably due to the efforts of manufacturers to make "lightweights" cheaply.

The objection that the lightweight tractor must obtain its tractive effort by means of speed has little or no point in the light of experience. The pull at the drawbar is due largely to the grip of the wheels upon the soil. The elimination of differential gears; the three-wheel drive; are important factors in increasing that grip; but the equipment of the driving wheel rims is the predominating factor.

As a whole this aspect of the farm tractor problem has received very little attention from designers. The latest model of the Pick tractor, which was exhibited this year at Lincoln, revealed original ideas, both as regards rear wheel design and construction, without contributing materially towards a solution of the problem of adhesion. In general, the angle iron cleats or strakes, either fitted parallel or obliquely to the rear axle, both with and without extensions beyond the rims, still hold the field as a standard equipment on wheeled machines for obtaining a grip upon the soil. Pyramid-shaped, or spade spuds, as they are termed, are an alternative method, when "staggered" over the face of the rims, for obtaining adhesion; and this type of wheel equipment is, undoubtedly, more effective when the soil is wet and sticky. A development of the angle iron type of cleats has been made with the Kardell Tractor. In this case a narrow, rear-wheel rim has been constructed and the angle irons extend across the face of the rim at regular intervals and for several inches beyond on both sides. It is obvious that by this method the packing of spaces between the cleats on the rim with soil, with its consequent lessening of the tractive effort, is prevented to a considerable extent, and, at all events, is much less likely to happen than with cleats extending only the width of a broad rim or slightly beyond on one side only. A development of this double extension on rear wheel rims has been made with the Sonia wheel. Here, angle-iron cleats are set V wise on the interior of narrow rims, with the point of the V against the inside of the rim, and with extensions beyond the rim on both sides. Thus a road and field equipment are furnished without additional fittings—

a very considerable item. On the road, the narrow rims take the weight of the tractor without the cleats touching the ground; while in the fields, the narrow rims sink into the soil and allow the ridges of the cleats to grip the soil—the adhesion thus obtained increasing with the looseness of the soil. On tough grass, ley or baked soil, or when the narrow rims will not sink sufficiently deep to allow the cleats to bite into the soil, forked extensions are fitted over the angle-iron extensions, so that a projection beyond the faces of the rims is secured.\* These variations reveal possible lines of development in adhesion. The prevailing practice, however, of running the offside wheels of a tractor in the furrow when ploughing, appear to make the application of the narrow rim and double cleat extension impracticable with the furrow-side wheel, as the wall of the furrow would certainly be ripped up in the process of ploughing. But there seems to be no reason why the narrow rim and double cleat extension on the landside wheel, coupled with a single extension on the furrow side should not be experimented with. Such an arrangement, applied with a locking of the differential to ensure a two wheel drive, would certainly increase the tractive effort of the ordinary wheeled tractors.

An interesting feature in the development of tractors has been in connection with fuel. In the early days the tractor was motived largely by two cylinder engines of large bore and stroke and of comparatively slow speed. When the engine had been warmed on a volatile spirit, such as petrol, it was comparatively easy for paraffin to be broken up and vaporised under the heavy compression and wholly burned in the course of the long slow stroke. Manufacturers who adapted the high-speed, multiple cylinder engine to tractor work did so with the idea of competing as a paraffin motor without thoroughly perceiving the difficulties it presented. Various attempts have been made to solve the problem without success. In America it has been solved largely by the use of gasoline, but, in view of the rapidly rising price of petrol and Benzole in this country, it is difficult to see how a change in this direction can be made. No other motor vehicle is such a heavy consumer of fuel as the farm tractor and the cost of petrol per acre would probably double that of paraffin as the 1919 Lincoln trials revealed.

Now as I have set out elsewhere,† it is possible to burn paraffin

\* See "The Problem of Adhesion," by C. Julian, *International Review of the Sciences and Practice of Agriculture*, July September, 1919.

† "Efficient Tractor Driving," p. 16.

in a four-cylinder high speed motor with reasonably good results, provided the compression is not too high and it is handled carefully. With careless handling, no matter what the vapourizer may be, it is a source of worry and expense. The Peterboro' (Plate II, Fig. 1) method is a move in the right direction. Forced feed and gravity feed lubrication assists. A combination of the Peterboro' method with an automatic switching over from paraffin to petrol as the load is lightened or removed, and from petrol to paraffin as it is taken up would help. An ultimate solution of the fuel question, however, so far as tractors are concerned, lies probably along the oil engine line, as exemplified by the Blackstone.

Another aspect of modern developments is the co-operation between the tractor and implement makers. In a few instances, of course, one firm turns out both, but in the majority of cases tractors are the products of makers not directly concerned with ploughs. The Fordson and Oliver (Plate II, Fig. 2) combination have set an example of close co-operation. In this case the effective coupling of the implement to the tractor has been simplified enormously. The movement in this close co-operation is growing, but a lot yet remains to be done. The coupling and operation of the mower and binder as a one-man outfit is an instance of the kind of problem to be solved.

A start has been made, as was pointed out earlier to equip the farm tractor as an efficient and economical power-unit for stationary work on the farm. But there has been very little progress in the direction of making farm tractors suitable for road haulage. Before very many months have passed the legal position will be made clear on this point. Every effort is necessary to widen the field of work for tractors. With the prevailing tendency of unit construction is not practicable to spring tractors upon the rear axles, but with the alteration of certain county regulations, no insurmountable difficulties are presented by this fact. With thick rubber pads or pneumatic tyres at speeds up to five miles per hour no great strains are thrown upon the construction if the front axle is well sprung. In other forms of construction, front and rear springing, as well as adequate brakes are a simple matter. Greater length of life for the rear springs could be obtained if they could be put out of action when in use on the land as was done in the Allday tractor.

## VII.

In general, developments in farm tractors have been rapid and continuous. In four years a great deal has been done towards



putting the new factor in farming on a sound basis. The fact that many problems still remain to be solved is a sign of healthy conditions. All forms of motor engineering are still in the transition stage, and the particular branch devoted to agricultural requirements is as alive to "needs and possibilities" as any other.

But in order to get the greatest possible results from the tractor in farming, the agricultural community as a whole, must look at the matter from a slightly different angle than hitherto. Developments in method and procedure with farming are as essential as changes in construction and design of power-units and implements. The tractor must be regarded not as a supplement to horse power, but as a new form of power. On the whole, the possibilities of farming by mechanical power have not yet been visualized by British farmers. Here and there comparatively, tractors and other forms of power-units have been installed in a spasmodic way, and often as a novelty to be abandoned after a short trial. In a few instances, what is equivalent to a revolution in farming has taken place by the whole-sale introduction of mechanical units, power driven, in conjunction with sweeping changes in procedure.

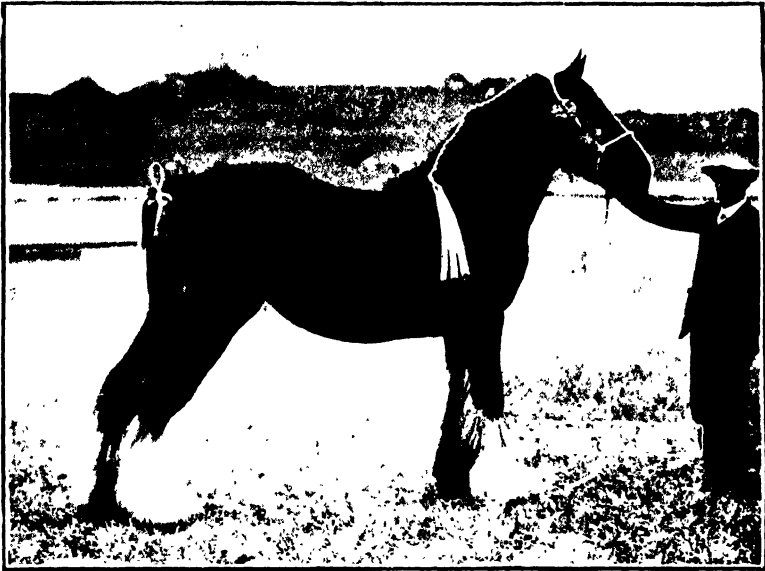
Why is the latter development so slow? In part, in my opinion it is due to the experiments in power farming made during the War under Government auspices. The Food Production Department imported large numbers of machines, mainly from America, for purposes of cultivating and harvesting. Most of these machines were unsuitable for British conditions. While, in addition they were used regardless of cost at the public expense, operated by partly trained men, and supervised by officials with little or no knowledge of agricultural conditions or power-machinery. As a consequence, farmers although accepting power machinery as a method of increasing output, were not impressed with the same as a possible economic factor in farming.

The conclusion, so far as present conditions are concerned is erroneous. In cases where suitable machines have been used and handled efficiently, their economic value has been clearly proved. In addition power-farming has afforded a way out of difficulties confronting farmers in general. The high and rising cost of animal keep, the shortage and price of labour may be overcome by this means. Indeed when the probability of an increase in foreign competition in the near future is taken into account, it is difficult to conceive any other solution to farming problems. A reversion to cattle, poultry or dairy farming is a partial solution, perhaps, but it can easily lead to the old "lean" years.

It is true that the farm tractor is only a unit in the broader aspect

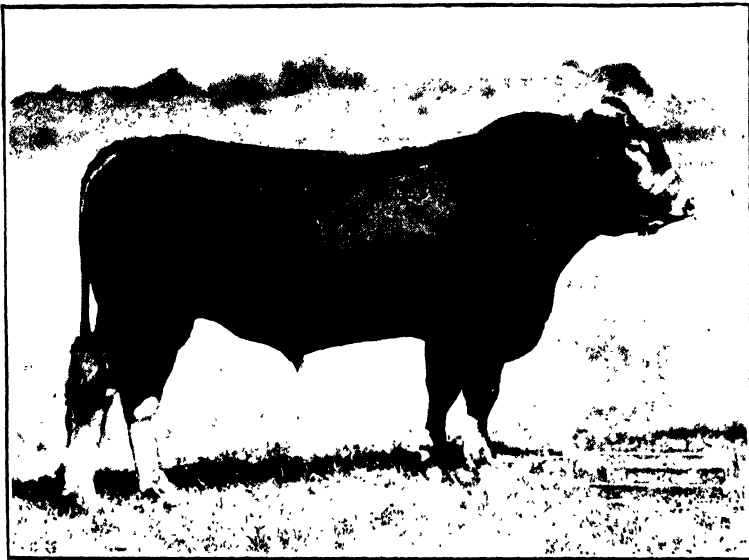
SALISBURY, 1920.

*(By the kind permission of the "Agricultural Gazette").*



SHIRE FILLY.

Mr. O. Williams' "Crossways Forest Maid." First Prize.



SOUTH DEVON BULL.

Mr. Harvey's "Coleridge Napoleon 4th." First Prize.

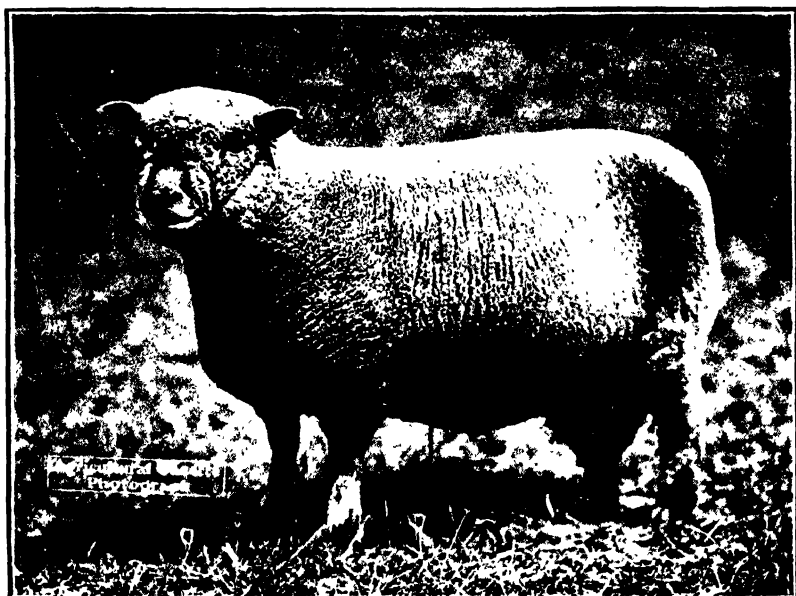


*(By the kind permission of the "Agricultural Gazette").*



**LARGE WHITE BOAR.**

**Mr. E. J. Wythe's "Copped Hall Clansman." Gold Medal.**

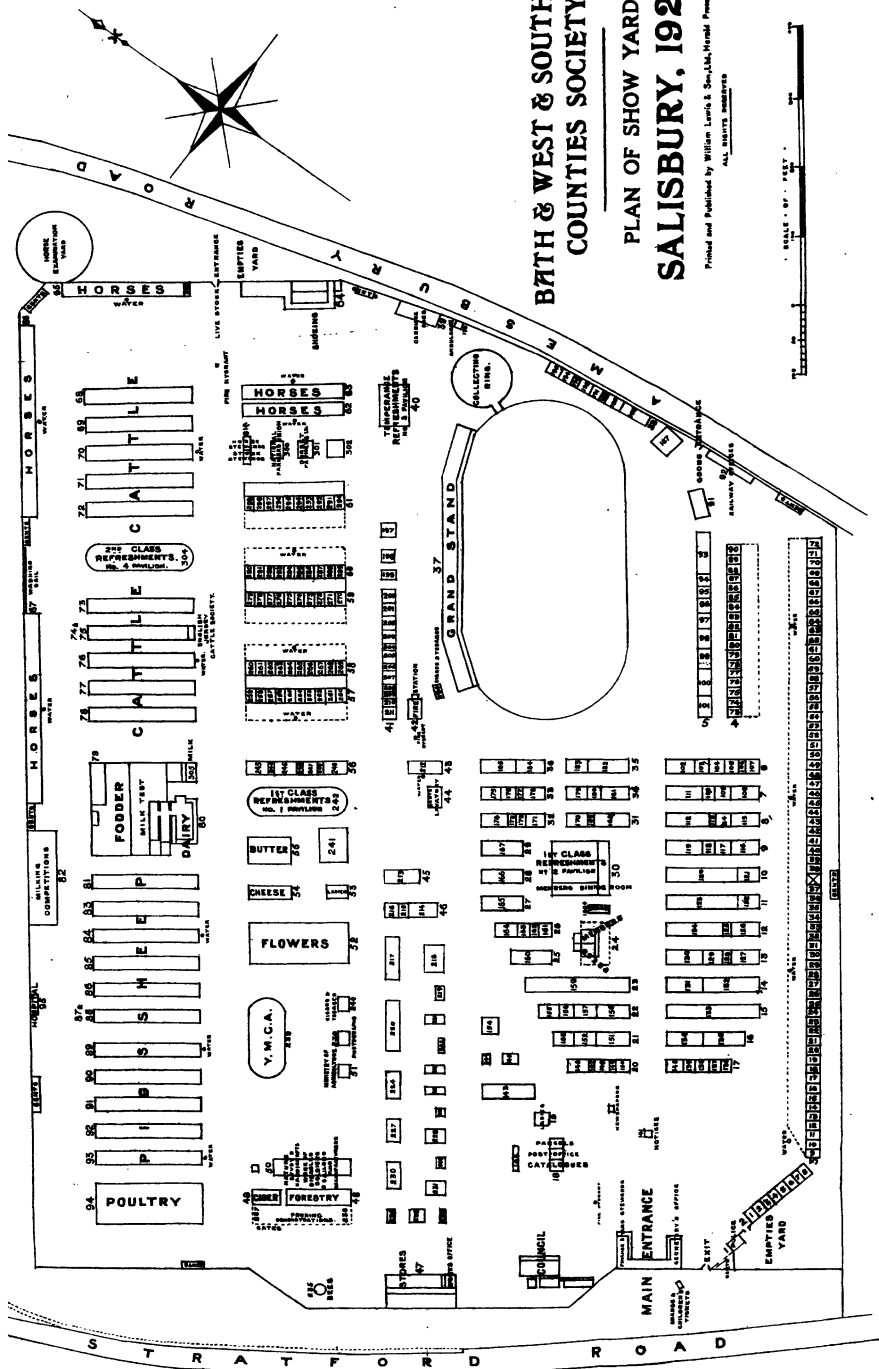


**Lady Ludlow's Southdown Ram. First Prize**

# BATH & WEST & SOUTHERN COUNTIES SOCIETY.

## PLAN OF SHOW YARD. SALISBURY, 1920.

Printed and Published by William Lewis & Son, Littlewood Press, Bath.  
ALL MEASUREMENTS IN FEET.





of power farming, and which is outside the scope of this paper. But it is an important unit: for it deals with the fundamental processes in arable farming—cultivating and harvesting. In order to get the fullest value out of a tractor the farming programme must be revised or modified. In brief, as mentioned above the point of view must be altered. The question is not “How can I use a tractor on my farm?” but “How can I farm to use a tractor fully?” From this standpoint, therefore, developments in farm tractors are as much the business of the farmer as they are of the manufacturer. Indeed they depend upon the former, and his wants for mechanical cultivation will decide, in the main, the lines of future development.

---

## · VII.—THE SOCIETY'S EXHIBITION AT SALISBURY.

*By W. A. Smith, Assistant Secretary.*

In 1914, previous to the outbreak of War, the Society accepted a cordial invitation from Salisbury to visit that City in 1916, but the large military camps in the neighbourhood of the town already taxed the railways to their fullest capacity, and indeed imposed such an exceptional strain upon the resources of the companies concerned that they could not contemplate handling Show traffic, in addition to the very heavy business associated with the War.

Under these circumstances the Council, after consultation with the Local Committee, regretfully came to the conclusion that it would be impossible to hold the show at Salisbury in 1916, but that the Society should visit the City at the earliest opportunity.

Accordingly, on the conclusion of the Armistice in 1918, and the withdrawal of the Government's prohibition, negotiations were at once opened with a view to holding the show in 1919, but this was not found practicable. In January of that year, however, a communication was received from the Mayor of Salisbury renewing the invitation for 1920, and this was unanimously accepted by the Council, the exhibition being opened on Thursday May 20th, and closed on Whit-Tuesday, May 25th.

The Show was inaugurated by the Mayor of Salisbury (Mr.

Councillor H. C. Lapham), who attended in state accompanied by the Deputy Mayor (Alderman Sir James Macklin), Major-General Sir Montague Harper, K.C.B., D.S.O. (Commanding Officer, Southern Command), and Members of the Corporation and the Local Executive Committee.

They were received by the President of the Society (The Earl of Radnor), and other Stewards and Members of the Society's Council.

In extending a welcome to the Mayor and Corporation, the President said it was over 50 years since the Bath and West Show had visited Salisbury, and he was glad to think that once again the honour had been bestowed upon the City after so long an interval. He felt a great deal of satisfaction at the presence of the Mayor that day, accompanied, as he was by the Members of the Corporation and other gentlemen who were Members of the Local Committee, and he most cordially welcomed them on behalf of the Society and felt that their visit there was an augury of the success which would attend the Show.

The Society's secretary then read the resolution passed by the Council, inviting the Mayor to inaugurate the Show.

The Mayor said he had the honour to respond to the invitation to inaugurate that great exhibition, and he did so in the name of the Corporation and Citizens of the ancient City of Salisbury. They regarded it as a great honour that the Society should have accepted their invitation to hold the Show in their City upon this, the first year of what they trusted would be a great and lasting peace. They would agree, he thought, that they had been able to provide not only a very suitable, but also a very beautiful site, situated, as it was, between the ruins of Old Sarum on the north and the City of New Sarum on the South. They felt it very fitting that that great Show should be held in their City that year, because the President of the Society, Lord Radnor, was one who was a very near neighbour to them, whom they honoured and regarded as one of their fellow Citizens, who always took the deepest interest in the public life of the City, and who had rendered distinguished service to the Country during the War. It was also a great pleasure to know that Lord Bledisloe was the President elect of the Society. Lord Bledisloe had been for many years the representative for South Wilts in Parliament, he took the greatest interest in their City and had rendered devoted service to the Country.

Though it was a truism to say that Agriculture was not only the oldest, but the most important occupation of mankind, yet he believed it was only during the recent years of War that this had



been brought home to the Nation. When the German submarines were taking their daily toll of food ships, they realised how important it was that the land should be well cultivated, and they were indebted to all the farmers of England for their endeavours to increase production. They had every reason to believe that through their invaluable help the country was enabled to pull through. He thought the Society was to be congratulated upon the large number of entries, and he trusted the exhibition of modern appliances and machinery would prove of the deepest interest, in instructing those who were anxious as to the best methods of increasing production and lowering cost. He had much pleasure in welcoming and wishing every success to the Society, and begged formally to declare the Show open.

The Earl of Radnor expressed the thanks of the Society to the Mayor for inaugurating the exhibition and to the Local Committee for what they had done in promoting its success. He thought they would agree that the site was well laid out and utilised to the best advantage.

Alderman Waters, who responded, said the work of the Local Committee had been comparatively small, but it had given them a great deal of pleasure to do everything they possibly could to assist in the preparations for the Show and help towards its success.

The Mayor was then presented with a handsomely bound copy of the Society's catalogue as a souvenir of the occasion.

The site of the Show was the Sheep Fair field situate between the Amesbury and Stratford Roads, and a plan showing the situation and arrangement of the Yard faces this report.

In 1866, when the Society held its Show at Salisbury, the disastrous outbreak of Cattle plague, which will be long remembered by Agriculturists, prevented the exhibition of Stock, and it was, therefore, decided to hold it again on the same site in the following year. Unfortunately, however, the plague was still prevalent and again the cattle Show had to be abandoned. On only one occasion since has a visit been paid to the County of Wilts, viz., in 1906, when a most successful Show was held at Swindon. The following is a statement of the entries in the Stock and Produce Classes at the three last shows held in the County, but the different conditions under which the Shows were held prevent the comparisons from being of value, other than as a matter of record.

A list of the awards, names of Judges, etc., will be found on pages i-lxxxviii of the Appendix to this volume.

	Salisbury, 1867.	Swindon, 1906	Salisbury, 1920.
<b>HORSES :—</b>			
Agricultural .. .. .	23	69	57
Hunters, Hacks, Ponies, Harness and			
Jumping .. .. .	29	297	172
		366	229
<b>CATTLE :—</b>			
Devons .. .. .		32	23
South Devons .. .. .		32	27
Shorthorns .. .. .		105	71
Herefords .. .. .		43	26
Sussex .. .. .		5	6
Aberdeen-Angus .. .. .		43	26
Jersey .. .. .		157	88
Guernsey .. .. .		56	55
Kerry and Dexter .. .. .		52	36
Red Poll .. .. .		15	30
British Friesian .. .. .			48
Gloucestershire .. .. .			4
Dairy .. .. .		87	109
		627	549
<b>SHEEP</b> .. .. .	148	202	244
<b>PIGS</b> .. .. .	65	166	227
<b>POULTRY</b> .. .. .		550	363
<b>FARM PRODUCE :—</b>			
Cheese .. .. .	0	75	51
Butter and Cream .. .. .	0	130	85
Cider and Perry .. .. .	32	63	42
Bottled Fruit .. .. .	0	0	12
	32	268	190
	297	2179	1802

The total amount offered in money prizes was £3,656 5s. 0d. contributed as follows :—

Bath and West and Southern Counties Society	£2,739	5	0
Salisbury Local Committee .. .. .	24	0	0
Wiltshire Agricultural Association .. .. .	100	0	0
Wiltshire County Council .. .. .	60	0	0
Hon. Lady Hulse .. .. .	27	0	0
Major J. A. Morrison, D.S.O. .. .. .	17	0	0
Shire Horse Society (or Medal) .. .. .	15	0	0
Suffolk Horse Society .. .. .	36	0	0
British Percheron Horse Society .. .. .	18	0	0
New Forest Pony Society .. .. .	30	0	0
Devon Cattle Breeders' Society .. .. .	37	0	0
South Devon Herd Book Society .. .. .	17	0	0
Shorthorn Society .. .. .	30	0	0
Dairy Shorthorn Association .. .. .	10	0	0
Hereford Herd Book Society .. .. .	37	0	0
Gloucestershire Cattle Society .. .. .	15	0	0
Red Poll Cattle Society .. .. .	34	0	0
English Aberdeen-Angus Cattle Association .. .. .	10	0	0
British Friesian Cattle Society .. .. .	25	0	0
English Jersey Cattle Society .. .. .	20	0	0

	£	s.	d
English Guernsey Cattle Society .. ..	20	0	0
English Kerry and Dexter Cattle Society ..	15	0	0
Hugh Morrison, Esq., M.P. .. ..	52	10	0
Lord Bledisloe .. ..	20	0	0
Mrs. Jervoise .. ..	15	0	0
Salisbury and District Milk Recording Society ..	5	5	0
Shropshire Sheep Breeders' Association ..	10	0	0
Kent or Romney Marsh Sheep Breeders' Association	17	0	0
Southdown Sheep Society .. ..	17	0	0
Hampshire Down Sheep Breeders' Association ..	58	0	0
Oxford Down Sheep Breeders' Association ..	10	0	0
Dorset Horn Sheep Breeders' Association ..	17	0	0
Dorset Down Sheep Breeders' Association ..	20	0	0
Exmoor Horn Sheep Breeders' Society ..	17	0	0
British Berkshire Society .. ..	9	0	0
Large Black Pig Society .. ..	17	5	0
Gloucestershire Old Spots Pig Society ..	15	0	0
Wessex Saddleback Pig Society .. ..	20	0	0

Gold, Silver and Bronze Medals were also given by the Society, and Medals or Plate by the Shire Horse Society, the Hunters' Improvement and National Light Horse Breeding Society, the National Pony Society, the Hackney Horse Society, Chas. A. Hanson, Esq., the Sussex Herd Book Society, the Aberdeen-Angus Cattle Society, the English Aberdeen-Angus Cattle Association, the English Kerry and Dexter Cattle Society, the English Jersey Cattle Society, the Southdown Sheep Society, the Gloucestershire Old Spots Pig Society, the Wessex Saddleback Pig Society, Major Vere Ker Seymer, Miss F. Donisthorpe, the Poultry Club and the Buff Orpington Club.

For the first time in connection with the Society's Show substantial prizes were included for Milk Recorded Herds in the Salisbury district, and a separate report upon this competition is given on pages 97-99 of this volume.

Full recognition was given to those breed Societies who have only recently established Stud and Herd books, and the exhibition of Percheron Horses, Friesian Cattle and Gloucester Old Spots Pigs was especially noteworthy.

#### IMPLEMENTS.

The Show of Implements was an unusually good one, the large amount of space taken for Machinery in Motion being especially noticeable. Owing to the difficulty in obtaining railway sleepers, it was not found possible to arrange, as usual, for a sleeper road to facilitate the transit of the heavy traffic through the Show Yard, and fears were consequently entertained as to what might happen in the case of very bad weather when the exhibits were being brought into the yard. Happily, however, these conditions did not arise

and no difficulties were experienced in this respect, the weather being most favourable and the yard when the Show was opened bore few signs of the heavy traffic which had taken place over it. Fine weather also favoured the removal of the exhibits, and when the Yard had been cleared of all buildings there was little evidence of the fields being any the worse for the holding of the Show.

The following is a comparative statement of the number of feet run of Shedding provided for implements, machinery, etc., and of the number of square feet of open space occupied by exhibits unsuitable for Shedding :—

	Salisbury, 1867.	Swindon, 1906.	Salisbury, 1920.
Machinery in Motion .. .. feet run	720	1,288	1,960
Agricultural Implements .. .. "	4139	3,955	2,300
Other Exhibits not strictly Agricultural .. .. "		785	355
Seeds, Cattle Foods, Artificial Manures, &c. .. .. "	180	1,235	1120
	5,039	7,263	5,735
Open Space for Farm and Horticultural Buildings, &c. .. .. sq. feet	..	34,031	18,430

#### MISCELLANEOUS DEPARTMENTS.

Nature Study, Handicrafts and Forestry exhibitions were again noteworthy features of the Show, and with a view to helping, so far as lay in the power of the Society, the men who had suffered for their country, a separate section had been included for work by Disabled Soldiers and Sailors. Separate reports dealing with these will be found on pages 90-95 of this volume.

Near the Forestry Gallery demonstrations of tree pruning and Grafting were given daily by Mr. T. Sharp, the Wilts County Horticultural Instructor, and of basket-making and rural industries by Disabled Soldiers from the Enham Village Centre.

Practical instruction in Bee-keeping was also given daily by the Wilts County Council Demonstrator, and a very complete exhibit of useful Bee appliances was arranged by the Salisbury and District Bee-keepers Association.

A fully equipped Working Dairy, in which the Butter-making competitions were held, formed as usual, a prominent feature of the Society's Show. Here various implements and appliances, including power and hand separators, were shown at work and the best methods of making butter and clotted cream were practically demonstrated.

There were also Milking and Shoeing competitions, the following being a comparative statement of the entries :—

				Salisbury, 1887.	Swindon, 1906.	Salisbury, 1920.
Butter-Making	..	..	..	0	117	80
Milking	..	..	..	0	20	36
Shoeing	..	..	..	0	156	44
				0	293	160

The Horticultural Pavilion was again a special feature of the exhibition, a choice display of plants and flowers being arranged, illustrating the great advances made in recent years in the breeding of new varieties and the improvement of old ones.

For the Stockmen and other employees engaged in the Yard, a reading and writing Pavilion was provided by the Salisbury Branch of the Young Men's Christian Association, and here addresses and entertainments were given in the evening.

The Ministry of Agriculture and Fisheries, and the Agricultural Wages Board and also the Ministry of Labour had Pavilions in the Show Yard and among other bodies allotted space were the English Jersey Cattle Society, the South Wilts Branch of the National Farmers' Union and the Salisbury Branch of the League of Nations' Union.

Meetings in connection with the National Fruit and Cider Institute, the Central Landowners' Association and other bodies were held in the Council Meeting room in the Show Yard, and on Whit-Monday an excellent lecture was delivered in the Y.M.C.A. Pavilion, under the auspices of the Ministry of Agriculture and Fisheries by Prof. Stapledon on "The Improvement of Grass Lands."

The usual Sunday Service, at which there was a large attendance of Herdsmen and others engaged in the yard, was held in the Y.M.C.A. Pavilion. The sermon was preached by the Bishop of Salisbury, and the service was conducted by the Society's Chaplain (the Rev. A. T. Boscawen). The Bishop was accompanied by Canon Myers, who carried the pastoral staff and the service was of a particularly bright description.

#### ATTENDANCE.

The Show was favoured during its whole period with beautiful weather, no rain falling while it was open, and this no doubt contributed to the satisfactory attendance of the general public. As

will be seen from the statements below, this compared very favourably with the Society's last visit to Wiltshire and was much in excess of the attendance at the Worcester Show in 1915. The fact that Salisbury races were held on the two first days of the Show, no doubt to some extent affected the attendance on those days, but the total cannot be regarded as otherwise than satisfactory, bearing in mind the comparatively thinly populated area of which Salisbury is the centre, and the absence of any excursion facilities. Owing to the largely increased cost of the show it had been found necessary to increase the admission charge on each day and this will account for the additional amount received in this respect.

Number of Admissions.			Admission Receipts.					
Swindon, 1906.	Worcester, 1915.	Salisbury, 1920.	Swindon, 1906.		Worcester, 1915.		Salisbury, 1920.	
			£	s. d.	£	s. d.	£	s. d.
49,851	35,773	44,647	3,188	2 9	2,519	2 6	7,242	10 10

## VIII.—REPORT ON THE SOCIETY'S DAIRY DEPARTMENT AT SALISBURY.

*By A. F. Somerville, Steward.*

The Society, having decided to buy the milk of the cows in the yard, the work of the Dairy Department was considerably increased by this new venture. It may be divided under three heads.

- (1) *The Working Dairy* : in which demonstrations were given and butter making competitions held.
- (2) *The Test Department* : for the butter test and milk trials.
- (3) *The Produce Department* : where the milk was bought and sold as milk, cream, butter and cheese.

In addition, milking competitions were carried on on three days of the Show in a separate yard, under the superintendence of Mr. A. R. White, the cows being kindly provided by Mr. F. Papps, the tenant of a portion of the show yard site.

The Working Dairy was placed under the control of the Steward, Major A. H. Gibbs, with Miss Look, Miss Thornbery, and Miss Hudson, Dairy Instructresses for the Wilts County Council, as assistants, Miss Nicholas, Dairy Instructress for Cornwall also giving valuable assistance.

On the first day of the Show, demonstrations were given by Miss Look and Miss Thornbery, of the making of butter and Caerphilly Cheese from Jersey and Shorthorn milks, six gallons of each being used both for butter and cheese. Six gallons of Shorthorn milk produced 2lbs. 12ozs. of butter, and that from Jersey, 3lbs. 5ozs. of butter. The same quantities of milk made respectively—Shorthorn 9-6lbs. and Jersey 10-37 lbs. of Caerphilly cheese.

Miss Thornbery also gave demonstrations in milk testing with a Gerber tester, and in the making of cream cheese.

In addition, samples were made from (1) Jersey milk, (2) Butter mixed with margarine, and (3) Butter made from dirty cream, which had the appearance of being of equal value, and shewn to the public, who were asked to select which was the best, the majority of the votes being for (2)—the butter and margarine. This was done as a warning to the public of the necessity for care in purchasing butter.

On the second day, demonstrations were given of making small holder's cheese in a round tub, with 6 gallons of mixed milk, which produced 8½lbs of Caerphilly cheese. Cheddar cheese was made in the same way with 12 gallons, producing 14½lbs. of cheese. In the morning there was a competition for Wilts County Council students for which 11 entered : most of these students had had no instruction during the last two years. In the afternoon there was an open competition for students for which 8 entered.

On the third day, demonstrations were given in the making of butter, cream cheese and clotted cream ; in the morning there were competitions open to the Wilts County Council students, for which 10 entered, and in the afternoon, an open competition for men and women for which there were 19 entries.

On the fourth day of the Show, a demonstration was given in the right and the wrong way of making butter by Miss Look and Miss Nicholas. In the former 6lbs. of cream produced 3lbs. 6ozs. of butter, and in the latter the same quantity of cream produced only 3lbs. There was a competition in the morning for Wilts County Council students, many of whom were ex-soldiers, for which 11 entered, and in the afternoon, an open competition for men and women for which there were 16 entries.

On the fifth day of the Show, the demonstrations were given by students in butter making in the morning and in the afternoon, the Championship butter making competitions were held, in which Miss J. Pritchard won the Gold Medal, Miss R. James the Silver Medal, Miss J. James the Bronze Medal, with Mrs. A. Gulliver reserve. There were good attendances at the Dairy all the days of the Show, and great interest shewn in the work done there.

# TEST DEPARTMENT.

The cows competing in the milk butter test, were stript at 5 and 5.30 p.m. respectively, for first and second milking on Thursday evening, and were milked at 7 and 7.30 a.m. and 5 p.m. and 5.30. p.m. respectively on the following day, and the cream in the butter test competition was churned at 7 a.m. on Saturday morning.

The milk tests were divided into three classes.

Class 123, for cows under 950 lbs. weight.

Class 124, „ „ over „ „ „ ; the prizes being given by the Society.

Class 125 confined to Red Poll cows for prizes given by the Red Poll Cattle Society.

For classes 123 and 124, there were originally 43 entries, but 17 were withdrawn, leaving 26 animals, of which 13 were in class 123, and the same number in class 124.

In Class 123 one cow failed to reach the standard. In Class 124 there were six below the standard.

The First Prize in Class 123 went to Mr. R. Bruce Ward's Jersey. "Ida" with a total points 58.15.

The Second Prize was won by Mr. W. M. Cazalet's Jersey "Fair-lawn Hussy," with 50.45 points, and the Third Prize went to Dr. Watney's Jersey "Lady Violet 2nd," with a total of 49.72 points; the Reserve being Mrs. Rudd's Jersey "Meadow Vale Pride" with 46.90 points.

In Class 124 the First Prize was won by Dr. Watney's Jersey "Sabina's Goose 2nd," with 50.10 points; the Second Prize went to the Marchioness of Graham's Red poll cow "Gressen Hall Southgate 6th" with 47.81 points; the Third Prize to the "Hache" Herd's Friesian cow "Brooklands Sietske 4th" with 46.50 points; the Reserve being Capt. Richardson's Red Poll cow "Stownpland Columbine" with 44.95 points. Two Highly Commended cards in these classes were awarded to cows making over 46 points and five Commended cards were given to cows making over 40 points.

Class 125. Red Polls. The First Prize was awarded to the Marchioness of Graham's "Gresson Hall Southgate 6th" with 50.11 points: the Second Prize to Capt. A. J. M. Richardson's "Stownpland Columbine" with 44.95 points; and the Third Prize to Mrs. A. Morrison's "Gressenhall Dagmar" with 44.07 points, Lord Hasting's "Melton May" being the Reserve with 39.87 points.

Four cows in this class were below the standard.



It may be noted that there is a difference in the points awarded in class 125 to those in the classes 123 and 124, owing to the fact that, unless a cow is served within 90 days after calving, her points for lactation are reduced in the two latter classes, but this rule does not apply to the Red Poll Society prizes.

The Butter Test Prizes were given in Class 126 by the English Jersey Cattle Society, and confined to animals entered in their Herd Book, and in Class 230 the prizes were given by Mrs. Jervoise, and confined to cows entered in the English Guernsey Herd Book. For Class 126 there were 24 entries, but of these 2 were absent, and one cow had to be withdrawn on account of illness.

The Gold Medal was won with a total of 54.45 points, by Mr. W. M. Cazalet's "Fairlawn Hussy," which made 3lbs. 1½ozs. of butter from 45lbs. 4ozs. of milk, the milk ratio being 14.70lbs. to a pound of butter.

The Silver Medal went to Mr. R. Bruce Ward's "Ida" with a total of 50.45 points; she made 2lbs. 11¾ozs. of butter from 51lbs. 12 ounces of milk, her milk ratio being 18.92lbs.

The Bronze Medal was awarded to Mr. W. G. Langland's "Teazel Snowdrop," with 45.45 points; she made 2lbs. 6¾ozs. of butter from 38lbs. 4ozs. of milk, her milk ratio being 15.79.

Nine Certificates of Merit were awarded in this class.

The Gold Medal cow, Mr. Cazalet's "Fairlawn Hussy" won the Second Prize in the Open Milk Test, and the Silver Medal cow the First Prize. In Class 230 the First Prize was awarded to Mr. Bainbridge's "Elfordleigh Roma," with a total of 36.50 points; she made 2lbs. 4½ozs. of butter from 47lbs. 8ozs. of milk, her milk ratio being 20.82. The Second Prize went to Mrs. Freville Cookson's "Iwerne Myrtle," with a total of 33.35 points; she made 1lb. 7¾ozs. of butter from 33lbs. 6ozs. of milk, her milk ratio being 22.48.

Dr. J. A. Voelcker, M.A., F.I.C., F.C.S., analysed all the milks in the Milk Test Classes and Miss Nicholas and Mr. Budgett assisted in the weighing.

In the Butter Test, Miss Nicholas superintended the churning, being assisted by Miss Look, who kindly brought 12 of her students to act as churners.

The Churning was started at 7.13 on Saturday morning, and was finished at 10.30. My thanks are due to the ladies who assisted in the churning, which was carried out expeditiously and most successfully. A very high standard was reached in Class 126, Mr. Cazalet's Gold Medal cow which had not competed before, being probably the best animal that has ever competed in the Butter Test at the Society's Shows.

## PRODUCE DEPARTMENT.

This was an entirely new venture, one reason why it was undertaken being the very high cost of cream required for the butter making competition. Sixty gallons of cream were required for these competitions, and this would have cost £90. Our experience leads me to think that, if butter making competitions are held on the first or second day of a Show, it may be necessary to supplement the cream obtained from the milk by a certain amount of bought cream, though no real difficulty was experienced with the cream, except in the first competition; but that may also be due to the fact that the competitors had had very little previous training.

The milk was bought at 1/- a gallon, and as each lot was brought in it was weighed, paid for, and a receipt given, and the milk afterwards put into milk churns through a strainer.

The milk required for cream was separated morning and evening. A certain quantity of milk was taken by a caterer every day, and the bulk of the milk which was not separated was sold in a Pavilion close to the working dairy, and the separated milk was also disposed of. On Whit Monday, it was calculated that about 4,000 glasses of milk were sold to the public.

The butter from the cream used in the butter making competitions was sold at the Pavilion, and also a certain quantity of small cream and other cheeses, and in addition a considerable amount of cream in cuplets.

It would have been impossible to carry out the purchase and sale of milk, if I had not had the valuable assistance of Mr. C. M. Squarey, and Mr. Jones, from the firm of Messrs. Rawlence & Squarey, Salisbury, who attended to the weighing of the milk, and kept the accounts, and were on the Show ground at 7 a.m. and very often had not finished their work till 7 p.m. They were also most helpful in taking goods to the Pavilion.

The Sales at the Pavilion were superintended by Miss Gifford, chief Dairy Instructress for Hants, who was assisted by Miss Carnley, Wilts County Council, Miss Hayden and Miss Knight.

I am also indebted to Mr. Ayre for the very convenient Pavilion which was erected in a couple of days, and to Mr. Williams, from the Horticultural Shed, who kindly supplied us with flowers.

I have gone rather fully into details, so that anyone who has charge of the Dairy Department at another Show may benefit by our experiences of this year.

I cannot conclude without expressing my thanks to the Directors of the Wilts, Hants and Cornwall Agricultural Committees, for allowing their Staffs to give us such valuable assistance.

## IX.—THE MILK-TEST CLASSES AT SALISBURY.

*By Dr. J. A. Voelcker, M.A., F.I.C., Consulting Chemist  
to the Society.*

With the renewal of the annual country shows of the Society came a pleasant change in regard to the Milk-Test classes. Instead of the nine cows only which competed at the last show held, namely, at Worcester, there was at Salisbury an entry of no less than 49. Of these 16 were found to be absentees when the show opened, and of the 33 which came into competition, one cow was taken ill during the Show and did not complete the trial.

In addition to the usual two classes for cows over and under 950 lbs. live-weight respectively, there was a special class for Red Poll cows or heifers, the prizes in this class being offered by the Red Poll Cattle Society. For this class there were 13 entries, 11 of which came to the Show, and 5 of them competed as well with the cows in the other two classes.

The same conditions as at previous Shows held good in regard to the quality of milk, namely, at each time of milking a minimum of 12% total solids, of which not less than 3% should be fat. In the open Classes 123, 124, cows not served within certain specified periods could only receive a reduced maximum of points for Lactation, but no such condition attached to class 125.

The cows were milked out on Thursday evening, May 20th, and the milk of the following day, Friday, May 21st, both morning and evening, was taken for deciding the tests.

After weighing the animals, it was found that 13 cows were comprised in each of the two classes, the other 6 cows competing only in the additional class for Red Polls.

The "light" class, comprised 12 Jerseys, and 1 Guernsey; the heavy class: 1 Devon, 1 Shorthorn, 5 Red Polls, 2 Friesians, and 2 Jerseys.

The total number of cases in which the standard of quality was not reached was 8. These were as follows.—Red Polls, 4; Devon, 1; Shorthorn, 1; Friesian, 1; Guernsey, 1.

*Class 123.*—Under 950 lbs. live-weight.

In this class only one cow, the Guernsey, failed to come up to the standard, the morning milk yielding only 2.7 per cent of fat.

The first prize winner was the six-year-old Jersey cow, "Ida." The total yield in the two milkings was close on 52 lbs.

The second prize cow, also a Jersey, "Fairlawne Hussy," 4 years old, was closely followed by the third prize winner, the 5½ year old

**MILK TEST CLASSES.**

No. in Catalogue.	Owner and Cow.	Breed.	No. of Days in Milk.
<b>CLASS 123.</b>			
361	Mr. G. Berry's "Nimrod's Dinah 4th "	Jersey	157
366	Mrs. Evelyn's "Wotton Lady Vil " ..	..	226
368	The late Miss E. M. Enderby's "Laitova " .. ..	..	38
369	Mrs. Evelyn's "Vervain's Bell 3rd " ..	..	167
371	Mrs. Hayes Sadler's "Hazon Chain " ..	..	92
372	Mrs. Hayes Sadler's "Donna Ypres " ..	..	58
375	Mrs. Rudd's "Meadow Vale Pride " ..	..	58
378	Mr. R. Bruce Ward's "Fine Lace " ..	..	57
379	Mr. R. Bruce Ward's "Ida " .. ..	..	107
380	Mr. R. Bruce Ward's "Hilda " .. ..	..	253
450	Mr. J. C. Forster's "Clatford Meadow Sweet 2nd " .. ..	Guernsey	23
544	Mr. W. M. Cazalet's "Fairlawn Hussy "	Jersey	92
548	Dr. H. Watney's "Lady Violette 2nd "	..	111
<b>CLASS 124.</b>			
102	Mr. W. G. Busk's "Wynford Daisy 2nd " .. ..	Devon	135
107	Mr. W. D. Chick's "Compton Harp " ..	..	58
108	Mr. W. D. Chick's "Compton Glitter 2nd " .. ..	..	38
156	The Olympia Agricultural Co.'s "Iford Princess Gwynne 2nd " .. ..	Shorthorn	35
260	The Marchioness of Graham's "Roll Call " .. ..	Red Poll	64
261	The Marchioness of Graham's "Gre-s- inghall Southgate 6th " .. ..	..	231
265	Major J. A. Morrison's "Kettleburgh Rosie 2nd " .. ..	..	22
271	Capt. A. J. M. Richardson's "Stown- land Columbine " .. ..	..	42
272	Capt. A. J. M. Richardson's "Bright- nell Queen " .. ..	..	95
322	Miss A. Guest's "Zuider Edith " .. ..	British Friesian	59
323	The Hache Herd's "Brookland Sutske 4th " .. ..	..	143
546	Mr. W. G. Langland's "Teasel's Snow- drop " .. ..	Jersey	107
547	Dr. H. Watney's "Fabina's Goose 2nd "	..	43

**MILK TEST CLASSES.**

Milk Yield.			Points for Milk.	Points for Lactation.	Total Points.	Awards.
Morning.	Evening.	Total.				
lb. oz.	lb. oz.	lb. oz.				
19 12	15 0	34 12	34.75	11.70	46.45	Highly Commended. Commended.
15 10	12 12	28 6	28.37	12.	40.37	
15 12	16 10	32 6	32.37		32.37	Highly Commended.
19 4	16 8	35 12	35.75	8.00	43.75	
15 10	12 10	28 4	28.25	5.20	33.45	
16 12	15 8	32 4	32.25	1.80	34.00	
23 8	21 10	45 2	45.2	1.80	46.90	Reserve.
22 8	18 12	41 4	41.25	1.70	42.90	Commended.
28 4	23 8	51 12	51.75	6.70	58.45	First Prize.
15 8	12 4	27 12	27.75	12.	39.75	
19 12	16 4	36	36.	nil	36.	Below standard.
25	20 4	45 4	45.25	5.20	50.45	Second Prize.
24 14	17 12	42 10	42.62	7.10	49.72	Third Prize.
19 8	13 14	33 6	33.37	8.0	41.37	Commended.
27	20 4	47 4	47.25	1.80	49.05	Below standard.
23 10	19 4	42 14	42.87	nil	42.87	Commended.
37	29 8	66 8	66.50	nil	66.50	Below standard.
21 12	17 12	39 8	39.50	2.4	41.9	Below standard.
23 4	16 9	39 13	39.81	8.0	47.81	Second Prize.
28 12	26 12	55 8	55.50	nil	55.50	Below standard.
25 4	19 8	44 12	44.75	.20	44.95	Reserve.
20	13 8	33 8	33.50	5.50	39.00	Below standard.
31	23 12	54 12	54.75	1.90	56.65	Below standard.
21 4	17 4	38 8	38.50	8.0	46.50	Third Prize.
21 12	16 8	38 4	38.25	6.70	44.95	Highly Commended.
29	20 14	49 14	49.87	.30	50.17	First Prize.

## MILK TEST CLASSES.

No. in Catalogue.	Owner and Cow.	Breed.	No. of Days in Milk.
CLASS 125.			
257	Messrs. T. Brown & Son's " Handsome Plantain "	Red Poll	115
258	Major H. Colmore's " Rendlesham Gentlewoman 2nd "		
260	The Marchioness of Graham's " Roll Call "	"	106
261	The Marchioness of Graham's " Gressenhall Southgate 6th "	"	64
263	Lord Hastings' " Melton May "	"	231
265	Major J. A. Morrison's " Kettleburgh Rosie "	"	27
267	Mrs. A. Morrison's " Gressenhall Dagmar "	"	22
268	The Earl of Radnor's " Longford Attraction "	"	72
269	The Earl of Radnor's " Winsome "	"	41
271	Captain A. J. M. Richardson's " Stowenpland Columbine "	"	67
272	Capt. A. J. M. Richardson's " Brightnell Queen "	"	42
			95

**MILK TEST CLASSES.**

Milk Yield.			Points for Milk.	Points for Lactation.	Total Points.	Awards.
Morning.	Evening.	Total.				
lb. oz.	lb. oz.	lb. oz.				
14	10 12	24 12	24.75	7.50	32.25	
10 12	16 4	27	27	6.60	33.60	
21 12	17 12	39 8	39.50	2.40	41.9	Below standard.
23 4	16 9	39 13	39.81	12.0	51.81	First Prize.
22	17 14	39 14	39.87	..	39.87	Reserve.
28 12	26 12	55 8	55.5	nil	55.5	Below standard.
23 4	17 10	40 14	40.87	3.20	44.07	Third Prize.
20	17 14	37 14	37.87	.1	37.88	Below standard.
14	13 4	27 4	27.25	2.70	29.95	
25 4	19 8	44 12	44.75	.20	44.95	Second Prize.
20	13 8	33 8	33.50	5.50	39.0	

Jersey, "Lady Violette the 2nd." It is worthy of note that the prize winner, "Ida," although coming in the "light weight" class, would have secured the First Prize in the "heavy weight" class, against even the Devons and Friesian cows in that division.

*Class 124.*—There were 7 instances in which the entries failed to come up to the required quality. The milk of one Devon cow was deficient in both fat and solids at the morning milking, the one Shorthorn cow similarly failing. Of the two Friesian cows, one gave 2·8 per cent of fat only at the morning milking, and there was a deficiency in total solids both morning and evening. The heaviest yield of milk was gives by the one Shorthorn cow entered, namely, 66½ lbs. at the two milkings; the second highest by a Red Poll, namely, 55½ lbs., and the third highest by a Friesian 54¾ lbs. All these, however, failed to meet the requirements as to quality, and the First Prize was awarded to the Jersey cow, "Sabina's Goose the 2nd," which was 6½ years old. The Second Prize went to a Red Poll, "Gressenhall Southgate the 6th," which was somewhat under 6 years old. A 7 year old Friesian, "Brookland's Sietske the 4th," took the third place, but with a very inferior yield of milk, for an animal of this breed.

*Class 125.*—In this, as already stated, 4 of the cows failed to give the required quality of milk, the First Prize was won by "Gressenhall Southgate 6th," which had taken the Second Prize in the "heavy-weight" class 124. The Second Prize was won by "Stownpland Columbine," a cow under 5 years old, and this was followed very closely by "Gressenhall Dagmar," a cow nearly 8 years old.

---

## X.—REPORT ON FORESTRY SECTION AT SALISBURY.

*By Godfrey Lipscomb, Steward.*

The great difficulty in these days of finding the time and labour necessary for the preparation of a Forestry exhibit are well known, and it was therefore with a certain amount of anxiety that one awaited the show. Thanks, however, to the substantial help of those interested in Forestry, old exhibitors as well as new, the Forestry Section at Salisbury was quite up to the average and in some ways was an improvement on that arranged at previous shows. It is obvious that the Forestry Section is appreciated by, and is helpful to foresters, and is an encouragement to them. There



was less repetition in the exhibits and there was more of a distinctly educational nature. This was the impression formed by the writer and confirmed by many of those interested. There is no doubt that though planting by private individuals on a large scale is now rendered most difficult if not impossible by the heavy, and increasing burdens on the owners of land, the love of Forestry will still induce many owners to continue, where they can, to plant on a reduced scale. In this way interest in the subject will be kept alive, but the hopes of the owners of woodland areas aroused by the Government have not been justified, and in the future big plantations on a commercial scale will be very largely in the hands of the Government.

To take the Forestry Section in detail, in Class 1, Lord Pembroke took the gold medal, with a carefully prepared and useful general Forestry exhibit, showing seedlings and young trees in various stages of growth, cones, foliage and specimens of timber and a section of Cedar of Lebanon, 227 years old, a very interesting exhibit. Capt. The Hon. R. P. E. Erle-Drax, took the silver medal with a small but very valuable exhibit, well and carefully got up, of specimens showing some of the fungoid growths and the pests that attack conifers, and other trees, and a good selection of specimens illustrating good and bad pruning, and the serious damage to timber that results from bad pruning. Sir Henry Hoare took the bronze medal for a fine collection of foliage of conifers—some hundred named varieties.

Lord Pembroke took first for Scots pine boards with a fine board cut from a tree 163 years old. Major Morrison was second with a board cut from a clean grown tree 80 years old. Lord Pembroke also took first for larch with a nice board from a tree 103 years old, a considerable age for larch which on many soils would be showing signs of decay in the butt at from 60 to 80 years old. Lady O. Shaw-Stewart took second with a board from a tree 68 years old. The boards in this class were not quite so good as usual. With exception of the first prize board they contained too many knots. For spruce Major Morrison took first, with a good clean board 80 years old. Lady O. Shaw-Stewart second, with a board from a very big tree 66 years old.

In Class 5 Lord Pembroke took first, the oak being a very nice board 153 years and the ash 69 years old. Lord Pembroke also took first in Class 6.

In the class for estate gates, the cost of making being taken into consideration, the Marquis of Ailesbury took the silver medal, and Lady O. Shaw-Stewart the bronze medal.

In the class not for competition, the Duke of Wellington, who from the inception of the Forestry Section has been one of its most consistent supporters, sent a very good selection of photographs and specimens. The Director of the Royal Botanic Gardens at Kew, also sent as usual an instructive and well got up exhibit which one hopes may help to call the attention of the public (if that were necessary), to the really excellent work done at Kew.

Major Morrison sent a good general exhibit of articles made up for Rural Industries, which attracted a good deal of attention. This is a most useful branch of development of which we should like to hear more. Major Morrison also sent a most interesting board cut from a branch of a very old oak that blew down last winter in Basildon Park, said to be over 1000 years old. The English Forestry Association, through Mr. Duchesne, for whose consistent and practical help in connection with the Forestry Section the Society is much indebted, and whose untiring efforts on behalf of the English Timber Industry we all appreciate, sent a very instructive exhibit showing the uses to which good English timber can be put, among them a beautifully made Jacobean door in oak. The parquetry work was also good. The Great Western Railway sent specimens of timber and various examples taken from sundry places on their railway showing the preservative effect of creosote on timber. The Ashton Court Estate sent a very interesting collection of photographs and specimens, among the former was a very good example of *Wellingtonia gigantea* grown in a plantation with larch under forest conditions, so that the side branches had not developed. One is so used to seeing *Wellingtonia* grown as a specimen tree that few people have considered the possibility of growing it in England commercially. In the case under discussion the timber is of the very best quality and with regard to growth, a comparison with the adjoining larch trees is in favour of the *Wellingtonia*. The plantation was made in 1867, and in 1911, the *Wellingtonias* averaged 66 feet in height, the larch 64 feet. Girth at 5 feet from the ground being, *Wellingtonias* on the average 4ft. 2in., and larch 3ft. 7in.

The National Fruit and Cider Institute sent their usual excellent and instructive exhibit, and as a matter of general interest showed several dishes of apples and pears of winter varieties, which had been kept since the winter in boxes hermetically sealed. As a result the fruit was perfectly fresh and full of juice with flavour unimpaired. The method of preserving had been to place the fruit in wooden boxes lined with a coating of wax.

The Margam Estate took a silver medal for a creosoting exhibit

showing the advantage of treating with creosote timber which, untreated, would be worthless.

The Enham Village Rural Industries Centre (Disabled Soldiers), sent an example of their work and in addition gave daily practical demonstrations in the working up of coppice wood, the making of hurdles, baskets, etc., employment which is particularly beneficial for neurasthenic cases.

By the kind permission of the Wilts County Council their Horticultural expert, Mr. Sharp, gave each day during the Show useful demonstrations outside the Forestry gallery on pruning, and spared no pains in answering questions and giving advice. The attendance at these demonstrations was encouraging, and one is led to hope that with interesting and educational exhibits in the Forestry Section, combined with practical outdoor demonstrations real good may result.

The best thanks of the Society are due to Mr. H. A. Pritchard for kindly acting as judge of the section.

---

## XI.- NATURE STUDY AND HANDICRAFTS.

*By H. M. Cundall, I.S.O., F.S.A.*

The works contributed by the different grades of schools, taken as a whole, formed an efficient educational display and demonstrated the results which were being obtained by the various institutions and schools in Wiltshire.

The Wiltshire Agricultural Committee contributed a good collection of living plants with the object of teaching the facts that plants are creatures of their environment. It comprised exotic plants showing pronounced adaptations, associated with their British relatives. The Dauntsey Agricultural School exhibits consisted of analyses of crops, soils, etc., wools and woollen processes, agricultural engineering and woodwork models, economic plants and research work.

In the Secondary School Section, Bishop Wordsworth School, Salisbury, sent an interesting exhibit illustrating the germination of plants and showing evidence of continuous instruction, and the Godolphin School, Salisbury, examples of carpentry, wood-carving and nature study drawings.

In the Elementary School Section, the Wiltshire Education Committee contributed a collective exhibit from nineteen different

centres. The work by the pupils of Maiden Bradley School was exceptionally good, and evinced considerable aptitude in the master for training children to observe and collect objects of interest in the locality, also for teaching them to make mechanical and other useful models; but many of the models were the work of the master himself, while others shewed signs of being executed by former pupils. Charts demonstrating rural economy from Winter-slow; sketches of tree life from Basset Down; a model of the Moot and drawings from memory from Downton; examples of grafting from Hindon; and medicinal plants from Sutton Benger were all to be commended as good examples of school instruction. To these schools, as well as to Tisbury, Malmesbury and Meneby St. Leonard certificates of proficiency were awarded. It is to be regretted that several elementary schools were allowed to contribute birds' eggs without any scientific arrangement and without any notes concerning them. Dried leaves were shown without records or sketches respecting the history of the plants. Such specimens are not to be commended, as they serve no educational purpose whatsoever. There was also a certain want of co-ordination in the arrangement of the exhibits and in many cases a lack of descriptive notes concerning them, which are most essential. It is very desirable that local educational authorities should make a selection of the best specimens in the various classifications before sending them for exhibition. The multiplication of the same kind of work of inferior quality only tends to depreciate the educational value of the exhibit as a whole.

The Salisbury Training College contributed a combined geological and botanical exhibit with excellent maps and diagrams.

There was a good display of handicrafts demonstrating the interest taken to promote industries in village centres by various associations. The Wiltshire Arts and Crafts Association showed examples of Stonehenge Woollen Industry; Longleat Slipper Industry; Sarum Wrought Ironwork; basketry from Tisbury, Hilperton and Devizes; rugs from Tisbury; lace from Downton; and embroidery and needlework from crippled classes at Fisherton-Delamere. The Dorset Arts and Crafts Association's exhibit comprised: Sunbonnets from Bloxworth and Moredon; filet lace from Rushmore; rush industry of mats and baskets from Blandford; embossed and coloured leather work, carved and painted woodwork after Scandinavian models from Studland; and toys of great variety, mostly from women's institutes. The Wiltshire Federation of Women's Institute exhibited needlework, bottled fruits, dairy produce and jams; articles made from waste, etc.

In the special section for the work of disabled soldiers and sailors, the Enham Village Centre, Andover, established for curative treatment and training of disabled men, contributed specimens of the work carried on in that valuable institution, of which Field-Marshal Earl Haig is the President. It consisted of basketry, boot-making, handmade furniture and rural wood industries, and farm produce. The Municipal College, Portsmouth, in which classes are held for the training of ex-service disabled men, sent examples of engineering work and specimens of boots and shoes. The remaining exhibits in this section were specimens of embroidered needlework contributed by individual men. The instruction in this work given in a hospital to a man whilst confined to his bed is useful in finding him some employment to occupy his mind. It is doubtful, however, if it should be continued to be encouraged after the man leaves the hospital, unless he is unfortunately quite incapacitated from carrying out any other occupation.

---

## XII.—THE EXHIBITION OF CIDER AT SALISBURY.

*By Major E. W. Farwell, Steward.*

The entries at the Salisbury exhibition in 1921 numbered 42, as against 56 at Worcester in 1915.

Money prizes or medals and certificates, at the option of the prize-winners, were offered in each of the classes, which were as follows :—

CLASS 189.—Cask of not less than 18 and not more than 30 gallons of cider, made in 1919, of a specific gravity not exceeding 1.015 at 60° Fahr.

CLASS 190.—12 Bottles of Cider, made in 1919, ditto.

CLASS 191.—Cask of not less than 18 and not more than 30 gallons of cider, made in 1919, ditto.

CLASS 192.—12 Bottles of Cider, made in 1919.

CLASS 193.—12 Bottles of Cider, made in any year previous to 1919.

Samples from each exhibit were submitted to Mr. F. J. Lloyd,

F.C.S., for analysis, and particulars of these analyses are set out in the accompanying table.

Mr. J. H. Wootton, of Byford, Hereford, was the Judge appointed by the Society, and the judging was carried out on the first day of the show.

Class	No.	Exhibitor.	Specific Gravity.	Alcohol by Volume.	Malic Acid.	Solids.	Awards.
189	1	H. J. Davis ..	1.012	5.55	.49	4.80	1st Prize
	2	Ditto ..	1.012	5.70	.49	4.72	2nd Prize
	3	J. M. Parry & Co. ..	1.006	6.00	.34	3.51	H.C.
	4	Pullen Bros. ..	1.011	5.50	.71	4.33	3rd Prize
	5	Ridler & Son ..	1.013	6.00	.63	4.64	Reserve.
	6	Tilley Bros. ..	1.009	5.50	.46	4.04	
	7	Ditto ..	1.014	5.05	.48	5.02	C.
	8	T. Webber ..	1.004	6.50	.63	2.77	
190	9	H. J. Davis ..	1.012	5.65	.43	4.81	1st Prize.
	10	Ditto ..	1.012	5.70	.49	4.76	3rd Prize.
	11	W. D. Lane ..	1.001	5.25	.38	1.68	
	12	J. M. Parry & Co. ..	1.004	5.55	.39	2.43	Reserve.
	13	Pullin Bros. ..	1.016	4.80	.62	5.52	H.C.
	14	Ridler & Son ..	1.014	4.50	.75	4.74	
	15	Tilley Bros. ..	1.009	5.55	.36	4.00	C.
	16	Ditto ..	1.013	5.30	.51	4.89	2nd Prize.
191	17	T. Webber ..	1.010	6.40	.53	4.41	
	18	H. J. Davis ..	1.030	3.10	.24	8.72	
	19	Ditto ..	1.025	4.45	.43	7.82	1st Prize.
	20	J. M. Parry & Co. ..	1.006	6.00	.33	3.52	2nd Prize.
	21	Pullin Bros. ..	1.011	5.55	.62	4.30	
	22	Ridler & Son ..	1.033	2.65	.76	9.08	
	23	Tilley Bros. ..	1.015	4.45	.32	5.08	3rd Prize.
	24	Ditto ..	1.016	4.10	.40	5.23	Reserve.
192	25	T. Webber ..	1.003	6.50	.56	2.57	
	26	H. J. Davis ..	1.030	2.90	.23	8.74	
	27	Ditto ..	1.025	4.25	.41	7.76	Reserve.
	28	Absent ..					
	29	H. G. Jones ..	1.038	1.30	.34	9.89	
	30	W. D. Lane ..	1.014	2.90	.23	4.54	
	31	J. M. Parry & Co. ..	1.008	4.70	.38	3.13	3rd Prize.
	32	Pullin Bros. ..	1.017	4.80	.74	5.45	
193	33	Ridler & Son ..	1.027	3.15	.58	7.70	
	34	Ditto ..	1.032	2.30	.71	8.63	2nd Prize.
	35	Ditto ..	1.034	2.60	.74	9.32	1st Prize.
	36	Tilley Bros. ..	1.015	4.55	.37	5.22	H.C.
	37	Ditto ..	1.017	4.00	.34	5.49	
	38	T. Webber ..	1.008	6.50	.54	3.93	
	39	H. J. Davis ..	1.028	2.65	.36	7.89	1st Prize.
	40	Ditto ..	1.022	3.50	.23	6.53	Reserve.
	41	W. D. Lane ..	1.024	2.20	.48	6.57	2nd Prize.
	42	Ridler & Son ..	1.023	3.50	.52	6.83	3rd Prize.

### XIII.—THE DAIRY HERD COMPETITION AT SALISBURY.

At a Meeting held on January 27, 1920, the Society's Council had before them an offer by Mr. Hugh Morrison, M.P., of prizes to the value of £52 10s. 0d. in connection with the Salisbury Show, and it was unanimously agreed to accept the offer and to allocate the amount to a class for the best managed Milk Recorded Dairy Herd in the District of the Show, to be judged on a scale of points, which would include milk yield, general appearance of Herd, including Bull and Young Stock, and the Management of Cowsheds and Dairies. As there was a Milk Recording Society in existence at Salisbury it was decided to limit the competition to Members of that Society, and to divide the amount offered into three prizes of £26 5s. 0d. ; £15 15s. 0d. and £10 10s. 0d. A fourth prize of £5 5s. 0d. was afterwards added by the Salisbury and District Milk Recording Society.

The Conditions of entry were as follows :—

- 1.—Each Exhibitor must be a *bona-fide* Farmer (viz., one who resides permanently on his farm, working it himself and deriving therefrom his principal and ostensible means of subsistence) and must produce for competition the whole of the Dairy Stock comprised in any one herd.
- 2.—All entries must reach the Secretary not later than March 26th, 1920, accompanied by the necessary entry fee. After March 26th and up to April 2nd, entries will only be received on payment of double fees, as above stated. The Council of the Society reserve the right to refuse any entry or to withhold any prize or prizes should they deem fit.
- 3.—The Judging will take place on the Farms previous to the Show at Salisbury, and exhibitors will have due notice of the date of the judging. All Dairy Stock on the farms entered for competition must, as far as is practicable, be brought to the Homestead to be judged.
- 4.—The Scale of points adopted in Judging will be as follows :—Milk Yield, 40 ; general appearance of Herd, 30 ; Young Dairy Stock, 15 ; Bull or Bulls, 10 ; general management of Cowsheds, Dairies and Premises, 5.
- 5.—All Exhibitors and their Exhibits will be subject to the general rules and regulations of the Society as printed in the Prize Schedule, and the decision of the Council as to the inter-

pretation of these conditions, the awards of prizes, or in all matters of dispute, shall be binding and final.

Thirteen entries were received and Mr. J. Crumpler of Longlands, North Coker, Yeovil, was appointed as Judge. He carried out his duties early in May, and awarded the prizes as follows, a full list of the other commendations being given on page *xlvi* of the appendix to this volume :—

- 1st. Mr. D. Combes, Jun., of Dinton Manor Farm, Salisbury.
- 2nd. Mr. M. W. Genge, of Stop Farm, Tisbury.
- 3rd. Mr. W. Date of Manor Farm, Bishopstone.
- 4th. Messrs. Wort & Way, Countess Farm, Amesbury.

The following is the Judge's report upon the competition.

"The first prize Herd is of exceptional merit in almost every respect. The yield of milk per cow from October 1st to May 1st is quite phenomenal being the extraordinary high average of  $3\frac{1}{2}$  gallons per cow per day, 8 cows having yielded over 800 gallons each to the 4th inst. This Competitor unlike many others has kept to the Dual purpose animal of the shorthorn type and character, and although the Salisbury Society only commenced operations in 1919, he has regularly recorded his cows milk yields for 16 years.

"The Herds of all the Competitors were looking remarkably well, including the young stock.

"In no case did I find a service bull bred from Registered parents with certified Milk Records of the Dairy. There is certainly room for improvement in this respect, and also in the keeping of a private Herd Book for each Herd, a copy of a full page, which I enclose, and your Society may like to publish for the benefit of breeders, Dairy Farmers, etc.

"The judging has been a great pleasure to me and I desire to thank the Competitors for the very kind and hospitable way in which they received and assisted me. I also desire to thank the two recorders, Miss Walters and Mr. Powell, for their help in connection with the records for the milk."

#### PRIVATE HERD BOOK.

<i>Name of Cow</i> .....	
<i>Colour</i> .....	
<i>Calved</i> .....	
<i>Breed</i> .....	<i>Reg. No.</i> .....
<i>Recorded from</i> .....	<i>to</i> .....
	<i>Ear Mark</i> .....
	<i>Sire</i> .....
<i>Dam</i> .....	<i>by</i> .....
<i>G. Dam</i> .....	<i>by</i> .....
<i>G. G. Dam</i> .....	<i>by</i> .....
<i>G. G. G. Dam</i> .....	<i>by</i> .....
<i>etc., see H.B., Vol.</i>	



*Service dates—*

.....	by	.....
.....	by	.....
.....	by	.....
.....	by	.....
.....	by	.....
<i>Sold</i> .....19....	<i>for</i>	£ : : .
<i>To</i> .....		
.....		
.....		

PRODUCE.

19.....	<i>calved a</i> .....	<i>Bor. C.C.</i> .....	<i>Milk Yields</i>
	<i>Sire</i> .....		
	<i>Named</i> .....		
	<i>Ear Mark No.</i> .....		
<i>Sold</i> .....	<i>reared</i> .....		
19.....	<i>calved a</i> .....		
	<i>Sire</i> .....		
	<i>Named</i> .....		
	<i>Ear Mark No.</i> .....		
<i>Sold</i> .....	<i>reared</i> .....		
19.....	<i>calved a</i> .....		
	<i>Sire</i> .....		
	<i>Named</i> .....		
	<i>Ear Mark No.</i> .....		
<i>Sold</i> .....	<i>reared</i> .....		

#### XIV.—ANNUAL REPORT UPON THE SOCIETY'S GENERAL OPERATIONS.

The Annual General Meeting of Members of the Society was held on Saturday, May 22nd, in the Council Pavilion in the Show Yard, Salisbury.

The President (the Earl of Radnor) occupied the Chair, and among the Members present were the Marquis of Bath, K.G., Messrs. R. Neville Grenville and W. Peacock (Vice-Presidents), Lord Bledisloe, Sir C. Miles, Bart., Rev. A. T. Boscawen, Col. R. A. Moore Stevens, Major E. W. Farwell, Professor J. Penberthy, F.R.C.V.S., Messrs. D. Alexander, D. Combes, jun., S. E. Corbett, H. M. Cundall,

I.S.O., F.S.A., J. E. Daw., E. G. Dulcken, V. T. Hill, F. H. T. Jervoise, E. Lewis, G. Lipscomb, C. M. F. Luttrell, G. Martyn, H. B. Napier, T. H. Pearce, J. F. Shelley, W. Singer, A. F. Somerville, C. C. Tudway, and A. R. White, O.B.E.

The Minutes of the last Annual General Meeting having been read and confirmed, Mr. D. Alexander moved, Mr. H. B. Napier seconded, and it was unanimously agreed that the Right Hon. the Lord Bledisloe be elected President of the Society for the ensuing year.

Lord Bledisloe having returned thanks the gentlemen named on page xcvi. of the Appendix to this volume were on the motion of Mr. E. G. Dulcken, seconded by Col. E. Lewis, unanimously elected Members of Council for the years 1920-22.

The accompanying Report, which had been adopted at a Meeting of Council held on the previous day, was then submitted to the Meeting :—

“ The Council, in presenting their Annual Report, congratulate the Members upon meeting once more in the Show Yard after five years, during which the War made such a meeting impossible. In spite of the great difficulties of the reconstruction period it was decided to proceed with arrangements for the Show and to re-visit the City of Salisbury after an interval of 53 years. The cordiality with which the Society has been received and the unusually large extent of the present exhibition fully justify the hope that so long an interval may not elapse before the Society pays another visit to the City.

“ The Society desire to express their appreciation of the friendly feeling shown towards it by the Wiltshire Agricultural Association, who have, in view of the Society's visit to the county, suspended the holding of their Show for the year and contributed £100 in prizes. Your Council have conferred upon the Association, members' privileges with respect to entries and admissions.

“ The Show of Live Stock is an unusually large one, exceeding in numbers the entries at the last Show held by the Society. New breeds of horses, cattle, and pigs have been included in the prize schedule, while special support has been given to milk recording and dairy cattle. The total space occupied by implements, machinery, etc., is well above the average of previous Shows, and the exhibits are fully representative of the latest inventions.

“ The interest taken in the Nature Study and Forestry exhibitions previously held by the Society and the general consensus of opinion as to their usefulness induced the Council to continue them at

Salisbury, and to amplify them by a combined exhibit from the County Council Schools in Wiltshire, and by a demonstration of Rural Wood industries. The Council desire to express their thanks to the Wiltshire County Council for their hearty co-operation. Poultry, shoeing, and other departments which, owing to the national demands created by the War, had been omitted from the Show in 1915, are again included.

“ During the past year the Society have sustained a very severe loss by the death of their late Secretary and Editor, who passed away in October last soon after relinquishing his office. Your Council felt they would be acting in accordance with the wishes of the Society by making some allowance to Mrs. Plowman as an acknowledgment of the services her late husband rendered the Society over a long period, and they have accordingly voted her an allowance of £100 per annum.

“ To fill the vacancy the Council have appointed as Secretary and Editor Mr. F. H. Storr, O.B.E., who during the latter stages of the War had been acting as Intelligence Officer on the General Staff, and who was strongly recommended by those with whom he had previously been connected. Further, in view of his long term of service with the late Secretary as Chief Clerk and the value to the Society of his special knowledge, they had appointed Mr. W. A. Smith as Assistant Secretary.

“ In making these appointments your Council felt that the responsibility for the publication of the Society's Annual Journal should rest entirely with the Secretary and Editor, and they have, therefore, terminated the appointment of Associate Editor held by Mr. F. J. Lloyd since 1890. In doing so they desire to record the Society's indebtedness to Mr. Lloyd for the valuable services he rendered the Society during that period.

“ The Council have been occupied with several matters of importance to Agriculture. First among them may be mentioned the question of the facilities for the carriage of live stock and implements to Agricultural Shows which were abolished during the War. The Council were largely responsible for promoting a deputation of the Agricultural Societies to the Ministry of Transport to urge the re-instatement of pre-war facilities, and they are pleased to report that the Ministry have so far yielded as to restore pre-war facilities for the conveyance of Live Stock. The subject will receive close attention in the future.

“ The numerous outbreaks of foot-and-mouth disease were a subject of much concern to the Council, who decided to strengthen

the hands of the Minister of Agriculture, so far as lay in their power, by giving expression to their appreciation of the efforts of the Ministry to suppress this troublesome disease. The attention of the Ministry was also drawn to the danger which might arise if the regulations governing the importation of live stock from abroad were relaxed.

"The thanks of the Society are due to the President for the interest he has shown in the question of the Society's Membership. An excellent response was made to his letter urging the importance of this subject, over 180 new Members having joined the Society since January. It is hoped that the advantages of a numerous Membership will be borne in mind by all Members of the Society.

"During the year the Council have, at the request of the authorities concerned, re-appointed Mr. A. R. White as the Society's representative upon the Board of Governors of Dauntsey School Foundation, and have accepted the proposal of the Central Council of Milk Recording Societies of England and Wales that the Society should become one of its first patrons.

"They have also continued their annual grant of £100 to the National Fruit and Cider Institute, the establishment of which was due to the practical and scientific research work initiated at Butleigh by Mr. R. Neville Grenville and conducted for some years conjointly by the Society and the Board of Agriculture. Experimental and research work is being actively carried on at the Institute, which there is every reason to believe is of essential service to those engaged in cider-making and fruit-growing. The report of this Institute, which appears in the current number of the Society's Journal, is of great interest. An arrangement has been made under which Members of the Society can obtain from the Institute, free of charge, analyses of cider apples and perry pears.

"With a view to assisting farmers and other in dealing with insect and other pests which affect agriculture, horticulture, etc., the Council have availed themselves of an offer from the Board of Economic Biology of the University of Bristol to investigate the nature of any insect or other pest and report upon it free of charge.

"A copy of the Society's Annual Journal for the current year has recently been forwarded to all Members not in arrear with their subscriptions, and the Council have every reason to believe that such a record of the Society's work, as well as of the leading agricultural topics of the time, is appreciated by the Members and by the agricultural world at large.

“The Council regret that during the year death has deprived the Society of several old and valued supporters, included among whom were Viscount Portman, a Vice-President and President of the Society in 1895, and Lord Moreton, a Vice-President for many years.

“Extraordinary vacancies on the Council have been filled up by the election of Messrs. R. Bruford, H. Bridgman, and J. I. Storrar.

“The Council have much pleasure in stating that they have accepted a very cordial invitation from Bristol to hold its 1921 Show in that City, and they recommend that the Right Hon. the Lord Bledisloe be elected President of the Society for the ensuing year, and that the gentlemen named on the Agenda Paper be elected at Members of the Council for the years 1920-1922.

“Your Council would desire to tender to the Right Hon. the Earl of Radnor their thanks for his services as President during the past year, and to express their appreciation of the support given to the Society in connection with the Salisbury Show by all those who have contributed to the Prize List and in other ways to the success of the meeting.”

The adoption of the report was moved by the President, seconded by Mr. S. E. Corbett and agreed to.

The Marquis of Bath moved, Lord Bledisloe seconded, and it was unanimously resolved :—“That the thanks of the Society be presented to the Mayor of Salisbury and the Local Committee for their efforts to promote the success of the Meeting, and to the Wiltshire Agricultural Association for their cordial co-operation.”

The Rev. A. T. Boscawen moved, Mr. A. R. White seconded, and it was agreed :—“That the thanks of the Society be presented to those Gentlemen who have kindly acted as Judges in the several departments.”

Mr. R. Neville Grenville in moving a vote of thanks to the President, said that Lord Radnor had followed in the footsteps of his predecessor as a good agricultural man and had made them an excellent President. They had not had a Show for four years, but he was pleased to see how well everything had come together again. Having referred to the previous Shows held at Salisbury, which were so greatly affected by the prevalence of the Cattle plague, he said that a great deal of the success of the present Show was due to the encouragement given by the President, and those gentlemen of the County who had worked with him. The resolution was seconded by Mr. G. Martyn and carried by acclamation, and the President, in

replying, said that when it was decided to hold the Show at Salisbury he was a little dubious about the attendances, having regard to the fact that the neighbourhood was thinly populated. But he hoped the three days beautiful weather with which they had been favoured would continue and, if so, he had no doubt regarding the satisfactory nature of the attendances, and the Society would again start on its hitherto successful career under the best possible auspices. He thanked them again for their kindness, and said that whatever small service he had been able to render the Society, had been done with the greatest pleasure and he hoped in the future he would from time to time be able to help them in very much the same way.

Mr. D. Combes, jun., expressed the opinion that the Council had acted unwisely in not making Saturday a two shilling day, in order to give the agricultural labourers an opportunity of visiting the Show, and the Secretary having explained that the Council would have been only too ready to have considered the suggestion if it had been brought before them, the Meeting terminated.

---

## XV.—THE NATIONAL FRUIT AND CIDER INSTITUTE.

*By B. T. P. Barker, M.A., Director.*

The following record of the work of the Institute for the year 1920 is less complete than usual. This is due in part to the fact that this year arrangements have been made to go to press some weeks earlier than in recent years. It has not been possible in consequence to secure some of the necessary records in time for inclusion. There are, moreover, a number of papers dealing with individual investigations which are awaiting publication, and the work dealt with therein will not be summarised in Report form until the original papers have appeared. Brief mention only is being made of several lines of work to which much time has been devoted, the problems concerned being difficult and consideration of results being inadvisable until a larger body of evidence has been accumulated. The actual amount of research progress during the year has also been materially checked in several directions owing to the almost continuous attention which the largely increased advisory work has required from the staff generally.

The year as a whole has been marked chiefly by progress of a more or less preparatory character. Most of the present members of the research staff have joined the Station since the spring of 1919; a large area of land has become available for planting; and

the older plantations have required overhauling. To meet the altered conditions, rearrangements in internal organisation have had to be made, extra working space in the laboratories has been provided, and the entire system of plantation work has been recast. The Station has thus been passing through a period of transition from practically the pre-war scale of operations, with its four members of the research staff and limited holding of land, to that now reached under which, including assistants and workers not directly attached to the staff of the Station, there are now 17 workers mainly occupied with research and over 200 acres of land awaiting development in addition to the area already planted with fruit. The effect of this extension of activity is only just beginning to be felt, but in due course there should be a decided advance in the output of results.

*Staff.*—With regard to staff changes during the year, the only loss the Station has sustained is that of Mr. C. T. Gimingham, whose impending departure was referred to in last year's Report.

The following additions have to be recorded: Mr. G. F. Peren, M.S.A., Toronto, has been appointed Pomologist of the Station. After the termination of the war he spent several months at the East Malling Fruit Research Station, assisting in the pomological investigations in progress there, and subsequently joined the staff of the Horticulture Division of the Ministry of Agriculture and Fisheries. He resigned his appointment there to take up his duties at Long Ashton last March. He brings with him useful experience of North American methods of fruit culture, having studied the subject at Guelph Agricultural College and Vine and Experiment Station, Canada, and engaged in practical fruit farming in various parts of that country before joining the Army at the outbreak of war.

Mr. F. Tutin has been appointed Bio-chemist. His early scientific training was received at University College, Nottingham. Prior to entering the Army he held the position of Deputy Director of the Wellcome Chemical Research Laboratory. During the war his health broke down as a result of work on explosives, and he was then transferred to the staff at the Lister Institute engaged on bio-chemical investigations. With his assistance it will now be possible to undertake new lines of work on some of the chemical processes involved in the growth of fruit trees and the development of fruit which have hitherto had to be deferred because of the lack of an organic chemist on the staff.

For a similar reason, some of the problems of fruit culture which must be attacked from the side of plant physiology can now be

taken up. Mr. F. Summers, M.Sc., D.S.O., M.C., has accepted an appointment in that subject and will come into residence at Long Ashton in the early spring of 1921 on his return from Ceylon, where he is at present engaged on botanical work for the Colonial Office. He is a graduate of London University, and has pursued post-graduate studies at the Universities of Liverpool, Zurich and Cambridge, holding one of the Ministry of Agriculture Research Studentships at the latter place until he entered the Army in 1914. After a distinguished career in France during the war he returned to Cambridge to work under Professor R. H. Biffen, F.R.S., before taking up his appointment in Ceylon.

The closing down of the Woburn Experimental Fruit Farm, which had been maintained since its opening in 1895 until recently by the Duke of Bedford, and conducted under the direction of the late Mr. Spencer Pickering, F.R.S., has enabled Mr. W. H. Neild, its manager since 1904, to join the staff at Long Ashton. He will act as Experiments Officer and Recorder for the outdoor work at the Station, a position for which his career at Woburn provides him with unique experience and qualifications. This arrangement fortunately ensures that touch with the valuable work which has been conducted in the past at that Institution need not be entirely lost, and that certain important subjects of investigation requiring further study can be proceeded with at Long Ashton with some measure of continuity.

Although not definitely attached to the staff of the Station, the following are temporarily associated in one capacity or another and are participating in various branches of the work.

Mr. C. P. Dutt, B.A., is continuing his investigations on certain chemical changes occurring during the ripening of fruit which, as reported last year, he is conducting at Long Ashton for the Food Investigation Board.

Miss Violet G. Scott and Miss Watson, the technical members of the staff of the Campden Experimental Factory, are temporarily stationed at Long Ashton and engaged on preparatory work in connection with methods of fruit and vegetable preservation. The factory mentioned, which is located at Chipping Campden, Glos., is now being equipped to serve as the centre for commercial scale experiments and trials on this subject. Hitherto this work has been done under temporary conditions at Dunnington and Broom Junction. The Fruit Preserving and Vegetable Drying Committee, appointed by the Ministry of Agriculture and Fisheries, is responsible for the administration of the scheme and Long Ashton has been requested to undertake the initial laboratory investigations



involved, as well as the supervision of the scientific side of the trials conducted at the factory. In future, therefore, there will be a close association between the staffs of the two centres and the facilities for work at either place will be available for both.

Miss Gilchrist, B.Sc., one of the Demonstrators of the Botanical Department of Bristol University, has recently started research in collaboration with Mr. Wiltshire, the Mycologist of the Station, on fungoid diseases of fruit trees. She is devoting attention in the first place to the disease of apple trees caused by a species of *Myxosporium*, referred to by Mr. Wiltshire in a preliminary note later in the present Report.

During the coming year it is hoped and expected that closer touch will be arranged between individual Departments of the University and the Institute which will lead to other cases of joint work of this kind. The Physics Department, through Professor Tyndall, has already rendered valuable help by making an examination of the physical properties of Spondite, a material lately introduced as an alternative to glass for horticultural purposes. This was required as a preliminary to comparative tests on growing plants which are being arranged at Long Ashton at the desire of the Chamber of Horticulture.

Mr. H. W. Miles, N.D.A., who until recently was a member of the staff of the Harper Adams Agricultural College and has now entered Bristol University as a research student, is devoting himself to investigations on certain insect pests of fruit trees in association with Mr. Lees.

*Land and Plantations.*—In the way of development the outstanding event of the year has been the purchase of Fenswood Farm. The approval of the Development Commission and the promise of a grant from the Development Fund were recorded in the last Report, but various causes of delay prevented the completion of the purchase until the end of the year. It has been decided not to take over the whole farm at once from the existing tenant on account of the difficulties which would be involved in starting farming operations on a large scale under the present difficult financial conditions. About 40 acres adjoining the present fruit plantations are, however, being attached to the Station immediately and prepared for fruit as quickly as possible. There is now no longer any need for its field work to be held up for want of land in the way that it has hitherto been since its foundation and already the establishment of a number of new plantations can be recorded.

The first of the larger root-stock trial plantations was planted

early in the year. The stocks being tested are the types of Paradise apple which have been selected at the East Malling Station, and the varieties of apples which have been worked upon them are Bramley's Seedling, Lane's Prince Albert and Worcester Pearmain. Similar trials are being conducted at East Malling and a few other centres where local conditions are distinct, and in the course of a few years useful information as to the respective merits of the individual stocks should be forthcoming. Concurrently with the field trials the investigations on the nature of root-stock influence, which were started some years ago, are being actively proceeded with.

Both this work and, more particularly, that on fruit-bud formation, which has been referred to in recent Reports, as well as several other problems, such as susceptibility to disease, have indicated the desirability of a much closer investigation of root action as a general subject than has previously been made at any of the fruit research centres. Various phases of the subject are now under examination at Long Ashton and a further extension is proposed for the coming year. One of the first points being studied is the history of the development of the root-system of the tree and its relation to root growth. A special plantation of apples on Paradise root-stocks has been established for that purpose and an account of the first season's observations, together with those of concurrent series of trials in sand and water culture, will be found in the present Report.

Last planting season also a three-acre plot of apples of the Allington Pippin and Edward VII varieties was planted up for manurial trials. These will be conducted in conjunction with manurial experiments on fruit trees in pots designed to furnish information as to the effect of individual constituents, such as nitrogen, potash and phosphates, on the health and fertility of the tree. Analagous trials with soft fruits are being arranged and a three-acre plot of gooseberries is being planted up with this object during the current planting season. The very varied results of manurial trials on fruit which have been reported from time to time both in this county and abroad suggest that it is imperative to give particular care to the arrangement of individual plots and the elimination of risk of overlapping effect between adjacent plots. Some information as to the root range of the trees under treatment is accordingly essential and a detailed examination as to the spread of the root-systems of individual trees of various ages is, therefore, now in progress at Long Ashton. Results already show that the area tapped by a single tree of comparatively young age is very

considerable and much more than expected. Even in cases of trees two years old only on Rivers' English Broad-leaved Paradise stock planted in early 1920 a completely new root-system with a circular spread of over a yard radius has been observed after one season's growth only.

Other plots of apples established last planting season include trial plots of seedlings which have been raised in the course of the fruit-breeding work, a variety trial plantation of some of the newer and more uncommon varieties which have not been previously tested, small plots of Bramley's Seedling, Lane's Prince Albert and Allington Pippin for special experiments required in connection with the fruit-bud investigations, and a small plot for the examination of the effect of double-grafting.

In addition, sixteen acres of land are now in course of preparation for an extensive experiment concerned with pruning and other methods for regulating growth and cropping of apple trees, for field investigations on the double-working of pear trees, for various field trials in connection with the problems of root growth and influence in apples, pears, and plums, and for testing the effect of pedigree bud strains for the same group of fruits.

During the current planting season a new 12-acre cider and perry orchard is also being established. This is being devoted to an examination of some of the more important problems which occur for grass orchards grown under farm conditions, such as the production of stout standard trees capable of withstanding damage from grazing live-stock, the maintenance of healthy growth in grass, and disease and pest control. The varieties selected will for the most part be those which were recommended in the last Annual Report for farm orchard work. A part of the orchard will be devoted to a selection of suitable table varieties of apples and pears, such as Bramley's Seedling, Annie Elizabeth and Newton Wonder, which promise to be profitable sorts under farm orchard conditions.

Arising in this connection, it may be mentioned that the Farm Orchards Committee has had under consideration during the year the report on the survey of West of England farm orchards which was referred to last year. A series of recommendations for the improvement of these orchards has been submitted to the Ministry of Agriculture and Fisheries, and the latter is proposing to take steps to give effect to them on the lines of a scheme which has already been prepared in draft form.

Several new plots of soft fruits are being provided. In the case of strawberries, a series of small plots designed to furnish information

on the question of factors influencing cropping quality has been started. A one-acre plot of raspberries has been planted to serve a number of distinct purposes. A very comprehensive collection of varieties, including leading Continental and American kinds, has been secured and it will function as (a) a variety trial, (b) a reference plot for the systematic work on the classification of the raspberry group of fruits which is now in hand, (c) a source of material required for fruit breeding investigations and (d) a source of fruit required for variety tests in canning, bottling and other methods of fruit preservation.

For the further study of reversion and control of "big bud" in Black currants room has been found in the cultivated portion of the experimental cider orchard adjoining the main buildings for a two-acre plot of young bushes.

The three-acre manurial plot of gooseberries has already been referred to.

Small plots have also been provided for the respective groups of seedlings of the soft fruits already raised in the course of the fruit breeding work.

Much has been done during the year in the older plantations to adapt them for special purposes. To a very large extent the objects for which they were originally planted have already been served and some have outlived their usefulness for further experimental work. In nearly all cases the trees were planted too close to permit of reliable results when fully grown. With younger plantations growing up to take their place and land available for further extension the need for retention in their original form has passed. Drastic alterations have therefore been made. Where it has been necessary to retain material to serve until younger trees are ready, this has been done, although, where convenient, wholesale thinning has then been practised to permit of horse cultivation in the place of hand work for reasons of economy. Trees no longer fit to serve any useful experimental purpose have been scrapped and the land applied to better advantage. Most of the older trees retained are being reserved for disease control experiments. In some plantations the opportunity of preliminary work on cover cropping methods is being taken.

*Buildings.*—No new buildings have been erected during the year, although a few minor alterations have been made in some of the existing structures. The original building scheme decided upon in 1912 has, in the case of the cider house, never been completed owing, in the first place, to the outbreak of war and, subsequently, to the serious increase in cost of building. It had been intended to modify

the old wing of the cider house to provide a more convenient mill and press room, a fruit loft equipped with fruit-washing apparatus and small fermentation rooms with temperature control. There being no immediate prospect of proceeding with the scheme, a small loft in the building has been adapted to serve temporarily as a warm fermentation chamber in time for the current season's work. It is recognised that adequate provision for fruit-washing must be made and an effort is being made to devise a scheme of arranging this which will not entail a too heavy outlay. A rather crude and not over efficient expedient is being tried as a temporary makeshift.

The present fruit room used for the storage of the market fruit crop grown at the Station is located in the old wing of the cider house, the original cider cellar having some years ago been adapted for the purpose when the present cellar was built in the new wing. The quality of the storage is not sufficiently good nor the space available adequate to take all the crop in full seasons. With a considerable acreage of young apple and pear trees likely to come into bearing within a few years, some more commodious and efficient storage must soon be provided. The character of the new store has not yet been decided upon. In view of investigations on systems of fruit storage which are now being conducted by the Food Investigation Board, it seems advisable to defer taking definite action for a while to await the outcome of this work. Cold storage methods are being tested in London and also at this Station. A cold store equipped with the necessary refrigerating plant has recently been erected here for this work. the cost being borne by the Food Investigation Board. It is divided into three compartments, the larger having a capacity of 1000 cubic feet, and the two smaller of 160 cubic feet each. The temperature is maintained by means of currents of cooled air and can be regulated by simple adjustment of inlet and outlet valves. The arrangement is such that each of the three compartments can be maintained at different temperatures. Another section of this work is being conducted at Cambridge, where attention is being mainly given to gas storage methods which are yielding results of great interest and economic possibilities.

The pressure on the laboratory accommodation, due to the increase in the number of research workers, has already been indicated. Some relief has been gained by transferring the quarters of those members of the research staff whose work lies mainly in the fruit plantations to two rooms in the office buildings, one of which was until recently occupied by the Live Stock Officer for the Bristol

Province. More office accommodation also being needed, another room has been converted into an extra office, and the whole building is now used exclusively for these purposes. By this rearrangement it is hoped that the present laboratories, with but slight internal alterations, may be made to serve until further increase in staff, which is unlikely for some time ahead, makes extension imperative.

*General.*—Although the developments of the Station in the direction of general farming, which follow as more land comes under its control, do not come strictly within the purview of this Report, reference ought to be made on this occasion to the very successful herd of Gloucester Old Spot Pigs which has been built up within the last three years. Not only were entries at the Royal and Bath and West Shows in 1920 placed at the head of their respective classes, but also the sale of surplus animals in August reached a remarkably high level, the average price per head being £65. At the representative gathering of agriculturalists who assembled on that occasion frequent reference was made to the useful part which the Station was playing in raising the standard of the Breed and presenting an example to farmers of the right lines on which to proceed. For these results Mr. W. Nixon, the late Live Stock Officer for the Bristol Province, whose personal help in establishing the herd and whose advice so willingly given at all times have been such factors in the success, and Mr. E. P. West, the Secretary-Manager of the Station, whose enthusiasm and judgment have been of inestimable service and under whose charge the work has been, have mainly to be thanked.

The Annual Tasting Day was revived in 1920 after a lapse of two years, the date being May 6th, the first Thursday in the month, in accordance with the usual practice. Both as regards size of attendance and the amount of interest shown in the work of the Institute the occasion ranked probably as the most successful of the series.

Educational exhibits illustrating the results of various investigations in progress at Long Ashton were sent to the Bath and West Society's Show at Salisbury, the Summer Provincial Show of the Royal Horticultural Society at Cardiff, the Summer Show of the Pershore and District Fruit Growers' Association, and the West Midland Commercial Fruit Show at Worcester. The interest taken in the exhibits on these occasions indicates that this is a side of the work of the Station which should not be neglected; but on the other hand the cost in time and money, both in preparation and at the shows themselves, is so considerable that some limit must be imposed. Most of the shows in the Western area unfortunately come at a

time of the year when fruit research is in full swing and members of the staff cannot be away from Long Ashton then without detriment to the work in progress.

Another method of bringing fruit growers and others interested into touch with the work of the Station was referred to in a preliminary way in the last Annual Report. The scheme in contemplation was the extension of the Governing Body of the Institute by the inclusion of representatives directly nominated by the larger fruit growers' Associations in the West of England, and a few of the most important outside that area. Representation of other bodies belonging to certain related industries and of various research organisations was also to be sought. These proposals were unanimously adopted by the Governors of the Institute and the following additions to the list of Governors have already been made :—

- G. F. Glenny, Esq. (representing the Wisbech and District Fruit Growers' Association).
- H. S. H. Bickham, Esq. (representing the Herefordshire Fruit Growers' Association).
- H. P. Pollard, Esq., J.P., F.R.H.S. (representing the Evesham Fruit Growers' Association).
- S. J. Shackell, Esq. (representing the Pershore and District Fruit Growers' Association).
- J. W. Humphries, Esq. (representing the Cheddar Valley Fruit Growers' Association).
- E. W. Bond, Esq. (representing the National Association of Cider-makers).
- Professor V. H. Blackman, F.R.S. (representing the Imperial College of Science and Technology, South Kensington, S.W.).
- F. J. Chittenden, Esq., F.L.S., V.M.H. (representing the Royal Horticultural Society).
- Professor W. Bateson, D.Sc., F.R.S. (representing the John Innes Institute).
- R. G. Hatton, Esq., M.A. (representing the East Malling Fruit Research Station).

It will be noted that the name of the Director of the East Malling Fruit Research Station, Mr. R. G. Hatton, M.A., appears in this list. The desirability of bringing the work of the two existing

Fruit Research Stations maintained by grants from the Ministry of Agriculture into close association is obvious and this has now been secured in some measure by the inclusion of the Director of either Station on the Governing Body of the other. A still more intimate link may be found desirable in order to facilitate mutual assistance, economical working, and avoidance of unnecessary overlapping at the two Stations. This matter is at present under consideration.

The remainder of the Report consists of summarised accounts of individual investigations which have been in progress during the year, the names of the members of the staff conducting them and responsible for the contribution appearing in brackets at the head of each section. A general acknowledgment of the help rendered by the Assistant Staff of the various Departments concerned may be made conveniently at this point.

Since several subjects which have received attention are not being dealt with in detail on this occasion for reasons already stated, the following brief notes on the nature of the work in some of these cases are given to indicate somewhat more completely the programme of work in hand.

#### THE FUNGICIDAL ACTION OF SULPHUR.

The phase of this investigation which has now been reached involves the accurate estimation of amounts of volatilised sulphur present in the atmosphere of compartments which have been subjected to sulphur treatment. Much time has been occupied in discovering a chemical method sensitive enough to register with a sufficient degree of accuracy the minute quantities which have to be determined. One which promises to be satisfactory consists in the oxidation of the sulphur to sulphuric acid by the action of dry bromine and concentrated nitric acid, followed by estimation as barium sulphate. There has been some difficulty in getting fair samples of atmospheres to be tested, but a form of procedure has now been devised which promises to yield uniform results. The determination of lethal doses of volatilised sulphur carried in the atmosphere can now probably be very soon proceeded with.

The experiments suggest that concentrations of sulphur of the order of one part of sulphur to 100,000 parts of air may be estimated with a fair degree of accuracy.

#### THE PECTIC SUBSTANCES OF FRUITS.

The significance of these substances in connection with the ripening processes of fruits is undoubted and they must be considered as playing a very important, if not determining, part on the



keeping quality of fruit during storage. Not only, however, is the character of the transformations undergone during ripening doubtful, but the chemical nature of the individual substances themselves is still little understood. During the course of the recent work of Mr. Tutin and Mr. Dutt on these points appreciable progress has been made, the relationship between pectin and pectic acid having been demonstrated and quantitative data as to the variations in amounts of these substances at different stages of ripening of fruit secured.

#### LEAF SCORCH.

This affection of the foliage of many kinds of fruit trees and of other plants was referred to in a preliminary paper in the 1915 Report. It appears, at any rate so far as the leaf is concerned, to be independent of the presence of any parasitic organism and must accordingly be classed among the so-called physiological diseases. Although during the war little could be done on this question from the experimental side, a considerable amount of information was collected relating to the characters of individual outbreaks and the nature of the soil and other local conditions in the affected cases. For the most part the data refer to cases on apple trees. The trouble is so widespread and the check to growth so serious in many cases that it has been felt that further investigation ought to be no longer postponed. Soils of affected areas of land have been taken for both chemical and biological examination and their composition is being compared with that of similar formations which do not show the scorching effect. One point which appears to be established already is that the root-system at the season of the year when scorching is most pronounced seems in a definitely unhealthy state. So far it has not been found possible to reproduce the trouble in typical form under experimental conditions, although a kind of scorch has at times been produced. An extensive series of experiments has been planned for the coming season, based on ideas suggested by observed facts, and it is hoped that they may throw some further light on the trouble.

#### FACTORS GOVERNING FRUIT-BUD FORMATION.

The last Report carried the story of this work to the point where the ringing and notching of branches of fruit trees were shown to produce definite effects both above and below the point of treatment. It was shown that the observed facts could be explained by Loeb's hypothesis of the presence of a growth-inhibiting substance or toxin. Subsequent work has been directed to a further examination of this hypothesis and it is considered that

the facts now available can be interpreted on the whole more satisfactorily by it than by the alternative hypothesis, which attributes the results to actual deficiency of food. During the course of the work several interesting questions affecting nutrition generally have been opened up and these are being further examined.

#### INVESTIGATIONS ON FRUIT PRESERVING.

There have been two main lines of work under this head which have been given particular attention during the past fruit season.

The first is that of preserving fruit for storage prior to its conversion into jam. Normally it is pulped by the action of steam and stored in casks, various sulphite preservatives being used to prevent subsequent fermentation and mould growth. This method, while simple and efficient if proper care is given to the stored material, nevertheless appears wasteful of heat and often results in considerable loss due to deterioration of the pulp through neglect to maintain the dose of preservative at the necessary strength. The results of experiments recently made suggest that it may not be difficult to devise a practical method which will give an improved product at less cost.

The second main line of work has to do with the preparation of jams and jellies by a cold process. The advantages of such a method, if practicable, are obvious. The cost of heating would disappear, the fresh fruit flavour would be retained unimpaired and the vitamine content of the fruit would probably remain undestroyed. The experiments have shown that the project is feasible, that a product of high quality can be prepared and that some of the obvious practical difficulties can be overcome. Whether any of the remainder will prove insuperable must be left for further investigation to determine.

#### ADVISORY WORK.

The number of enquiries received during the year ending September 30th, 1920, was 291. The figures for the counties as well as totals and the corresponding figures for previous years are set out as below.

	Year ending September 30th.				
	1916.	1917.	1918.	1919.	1920.
Gloucester (including Bristol) .. ..	21	24	21	29	53
Hereford . . . . .	9	6	2	6	10
Somerset .. . . .	50	52	46	75	79
Wiltshire .. . . .	10	4	0	6	3
Worcester .. . . .	26	16	11	11	29
Other Areas (including Campden) ..	89	31	93	75	117
Total .. ..	205	133	173	202	291

The figures for "other areas" include Devon and Monmouth, which counties contribute an annual grant to the Institute.

Twenty-one enquiries were received from the Ministry of Agriculture's Experimental Station in Fruit and Vegetable Preservation at Campden, Glos. These being of an advisory nature are included in the total figures for 1920, and not in the figures for Gloucester. In previous years this figure did not appear.

Most of the enquiries were horticultural in nature, though a certain number of agricultural questions were answered as well.

#### NATURE OF ENQUIRIES.

*Fruit Products.*—Some 60 replies were given under this head, the majority of them having to do with cider work. As showing the wide field from which enquiries on this subject arise, mention may be made that advice was furnished to correspondents in Ireland, Scotland, Isle of Jersey, Canada, New Zealand, U.S.A., and Manchuria. Three enquiries demanding special investigations and journeys were received namely :—

- (1) The construction of glass lined cement tanks for cider.
- (2) The rebuilding of a cider factory.
- (3) The starting of a cider factory.

*Campden Enquiries.*—Twenty-one enquiries of a technical character passed on from the Ministry of Agriculture's Experimental Station on Fruit and Vegetable Preservation have been dealt with. These have been concerned for the most part with matters arising in connection with various methods of preservation and the manufacture of preserves, as, for example, the estimation of the pectin content of fruit pulp, the preparation of fruit pulps rich in pectin, the use of a certain form of sugar syrup in jam-making, the analysis of jams, the use of sodium bicarbonate to neutralise excessive acidity in preserves, the preservation of fruit pulp by calcium bisulphite, and vacuum processes for fruit and vegetable drying.

*Mycological.*—Some sixty-six replies were given under this head, most of them referring to fairly well known diseases. The outstanding feature of the diseases in the advisory province was the severe damage wrought by the chocolate spot of beans. This disease, which is probably bacterial in nature, caused great losses in Hereford, Somerset and Wilts. The spread of the disease was

very rapid and in severe cases the haulm was reduced to a black rotting mass. The disease would appear to occur to a certain extent every year, but the weather conditions of 1920, were so favourable to it that the disease assumed epidemic proportions. The bacterial disease of plums, noted last year, was reported again from the same source, and since then specimens of the disease have been received from Somerset, Hereford and Monmouth. The disease is now the subject of investigation. A disease of Michaelmas Daisies reported from Worcestershire, and since identified in three places in Somerset, has been under investigation. It is probably due to a vascular parasite of the *Fusarium* genus.

*Pomological.*—About twenty replies were given under this head including such subjects as apple stocks, identifying varieties, suitability of land for fruit tree planting, books on fruit growing, effects of grass on trees, identification and treatment of weeds, etc. Questions on pruning and ringing of apples are not included here, but referred to under the Entomologist's report.

*Shows.*—An exhibit from the Station was sent to the following shows :—

- (1) The Bath and West at Salisbury.
- (2) The Royal Horticultural Society at Cardiff.
- (3) The Pershore Fruit Growers' Association at Pershore.

#### AGRICULTURAL CHEMISTRY.

During the year 36 requests for advice have been dealt with. The sources and nature of these enquiries—together with any special points of interest with reference to them—are given below.

#### SOURCES OF ENQUIRIES :

Gloucester (including Bristol)	...	...	...	14
Hereford	...	...	...	2
Somerset	...	...	...	9
Wiltshire	...	...	...	0
Worcester	...	...	...	1
Counties outside the Bristol Province	...	...	...	10
Total	...	...	...	36

NATURE OF ENQUIRIES.

1.—*Soil Problems.*

(a) *Soil Manurial Enquiries.*

Pastures and meadows	...	...	...	...	...	4
Arable soils	...	...	...	...	...	7
Fruit soils	...	...	...	...	...	2
Garden soils	...	...	...	...	...	3
Total						16

(b) *Miscellaneous Soil Problems.*

Advice re laying down of pastures and temporary leys	2
Advice re suitability of land for fruit growing...	1
Enquiry as to reasons for strawberry failure ...	1
Condition of soils in cases of Club Root disease ...	2
Examination of soils on which plants were apparently suffering from Chlorosis . . . . .	1
Survey of fields in which soils were suspected of containing lead ... . . . . .	1
Soil conditions in case of clover sickness (Sclerotinia disease) ... . . . .	1
Enquiry into case of Leaf Scorch ... . .	1
Total ... . .	10

2.—*Miscellaneous Enquiries.*

- (1) Analysis of sample of "night soil."
- (2) Dry matter in a sample of mangels.
- (3) Use of guano as manure for arable land.
- (4) Dry matter in two samples of swedes.
- (5) Use of burnt lime as a fertiliser on rough grassland.
- (6) Manurial value of two samples of flue dust from electric works.
- (7) Determination of "hardness" of sample of water to be used in soap sprays.
- (8) Manurial value of leather clippings.
- (9) Value of a South African shale as a fertiliser.
- (10) Manurial value of some radio active residues containing "radio-thorium."

(11) Manurial value of wood ashes from burnings made on a farm.

(12) A case of "scouring" among cattle.

Total ... .. 12

*Observations on Soil Enquiries.*—In dealing with these enquiries twelve visits to Farms have been made and it has been necessary to make partial or complete analyses of fifty-one samples of soil. Twenty-four of these samples were found to have "Lime Requirements" and in eight cases the "Lime Requirements" exceeded 0.3% Ca CO<sub>3</sub>. Particulars of these high "Lime Requirements" are given below.

NATURE OF FIELD.	LOCALITY.	LIME REQUIREMENT %Ca CO <sub>3</sub> .
Old Pasture.	Yate, Gloucestershire.	0.434
* Arable	Lydney, "	0.50
* do.	Mendips, Somerset.	0.419
* do.	do.	0.545
* do.	do.	0.775
* do.	do.	0.90
* do.	do.	0.30
Old Pasture	do.	0.860

#### SPECIAL INVESTIGATIONS UNDERTAKEN AS THE RESULT OF ENQUIRIES.

Five "Special Investigation Problems" of a more or less purely chemical nature have been undertaken, two of which have been completed, two are to be continued during next season, and one has been set aside to be dealt with more fully at some future date.

##### *Details of "Special Investigations."*

(1) Survey of the soils of six fields suspected of containing lead, on a farm situated on "The Mendips," Somerset.

The farmer had lost eight cattle from "Lead poisoning" during the previous season. Samples of soil from various parts of six fields suspected of containing lead were tested for lead, and the soil in one of the fields was found to contain lead in considerable quantity. It is hoped that an opportunity will occur in the future of making a detailed survey of the "Lead Soils" in this district, as several fields in the district are known to contain lead.

(2) Enquiry as to the cause of a case of Chlorosis at Winscombe, Somerset. (Joint investigation with Botanist of Research Station.)

\* Denotes newly "broken up" pastures.

Four samples of soil from affected areas were taken for qualitative tests. Three of the samples appeared to be similar, containing large amounts of carbonates, whilst the remaining sample appeared to contain only a normal supply of carbonate (about 1% Ca CO<sub>3</sub>.)

Two of the soils—one with high carbonate content, and the one containing normal amount of carbonate—were tested for the presence of toxic metals, and determinations of their lime (CaO) and magnesia (MgO) contents were made.

*Results.*

(a) Only metals normally present in fertile soils found.

(b) Soil with high carbonate content—

%CaO 12.83—%MgO 2.68.

Soil with normal carbonate content—

%CaO 1.57—%MgO 2.05.

Pot experiments have been carried out in which samples of four soils have been sterilised by heating to 120°C., and subsequently inoculated with about one-tenth of their weight of soil taken from a plot at the Research Station.

Two crops—1st Mustard, 2nd Tomatoes—have been grown in these treated soils and in samples of the soils not previously treated.

*Results.*

	TREATED SOILS.	UNTREATED SOILS.
MUSTARD CROP.	Vigorous growth. No signs of chlorosis in any pot.	Fair growth. No distinct chlorosis in any case.
TOMATO CROP.	Growth poor. Chlorosis distinct on plants in three soils with high carbonate content.  No chlorosis in soil with normal carbonate content.	Growth very poor. Chlorosis distinct on plants in three soils with high carbonate content.  No chlorosis in soil with normal carbonate content.

It is proposed to continue this work during the coming season.

(3) Pot Experiments on mustard and lettuce plants to ascertain the manurial value (or otherwise) of some radio-active residues in which the radio-activity is due to the presence of radio-thorium.

A preliminary experiment has been carried out on mustard and lettuce plants to obtain indications re amounts of the residues to use, etc. It is hoped to be able to obtain a definite result during the coming season.

(4) An investigation into the composition of "Nitre Bearing Shale" from South Africa with reference to its value as a fertiliser.

This shale is said to contain quantities of potassium nitrate varying from 1 or 2% to 25%.

The two samples examined were brown in colour and had been ground to fine powders.

The results of the analyses are given below :

*Sample I.*

QUALITATIVE ANALYSIS.		QUANTITATIVE ANALYSIS.	
<i>Water soluble constituents.</i>			%
Metallic Radicals present	Acid Radicals present	Moisture .. ..	3.68
Calcium	Sulphuric	Loss on Ignition .. ..	10.02
Magnesium	Nitric	Insoluble in water (earthy matter) .. ..	84.98
Potassium	Hydrochloric	<i>Water soluble constituents.</i>	
Sodium		Potash ( $K_2O$ ) .. ..	3.74
		Nitric Acid ( $NO_3$ ) .. ..	5.35

*Sample II.*

QUALITATIVE ANALYSIS.		QUANTITATIVE ANALYSIS.	
<i>Water soluble constituents.</i>			%
Metallic and Acid Radicals as in Sample I.		Moisture .. ..	3.88
		Loss on Ignition .. ..	10.64
		Insoluble in water (earthy matter) .. ..	83.89
		<i>Water soluble constituents.</i>	
		Potash ( $K_2O$ ) .. ..	4.03
		Nitric Acid ( $NO_3$ ) .. ..	5.6

(5) The Potash Content of "burnings" made on a farm.

These samples were taken from the ashes of routine burnings in connection with the ordinary cleaning of fields and hedges.

MATERIALS BURNED.	APPEARANCE OF SAMPLE.	% POTASH ( $K_2O$ ) PRESENT SOL. IN DILUTE HCl.
1. Hedge Trimmings.	Appeared to be good sample of burnt twigs.	1.44
2. Couch Grass.	Contained much soil.	0.56
3. Hedge Trimmings and Couch Mixture.	Contained much soil.	0.40
*4. Thistles and Rough Grass.	Appeared to be an excellent sample.	22.93

\* About one bucketful of ashes of this quality were obtained from burning one cart load of material.



In addition, work has been done in connection with two other special problems mentioned elsewhere in the general Advisory Report.

#### ECONOMIC ENTOMOLOGY.

The subjects dealt with were as follows :—

Insects	...	...	...	...	...	35
Sprays	...	...	...	...	...	9
Diseases	...	...	...	...	...	10
Fruit Questions	...	...	...	...	...	10
Miscellaneous	...	...	...	...	...	1

Under the heading “Insects” all other economic groups such as Myriapoda, Arachnida and Mollusca are included. Of special interest under this heading may be cited the common attack of Mangolds by Turnip Flea Beetles, also an attack of Mangolds by a larva of a beetle of the genus *Silpha*.

A case of flax attacked by *Longitarsus ater* was reported from Somerset, but no action was taken as the attack had nearly spent itself at the time of investigation.

“Diseases” indicates maladies other than those caused by fungi and insect pests. Of these ten enquiries, six referred to “reversion” of black currants and three to leaf scorch. Both these subjects are referred to in the Research Report.

Of special interest is a newly reported disease of strawberries known as “red leaf.” This has been sent in by the Tamar Valley growers, where it is said to be causing much trouble. At the present moment nothing can be said as to its nature or cause.

Among the “fruit questions” those referring to pruning and the practice of ringing may be mentioned. These are the direct outcome of research work on these subjects done at Long Ashton.

#### VISITS.

A special visit was made to Norfolk and other districts in East Anglia in connection with reversion of black currants. Besides affording an opportunity to communicate to eastern growers the results so far attained in research work, the visit enabled valuable comparative data for the different climatic conditions to be obtained.

General advisory visits were made to Worcestershire and Herefordshire.

## APPLE TREE CANKER.

(S. P. Wiltshire and G. T. Spinks.)

In the report for the year 1919 a preliminary account was given of the infection of young buds by *Nectria ditissima*. During the present season, these observations have been extended considerably and many new facts regarding this type of infection obtained. It is not proposed here to discuss in detail the evidence of the manner in which the fungus infects the tree since this will appear elsewhere in due course; but merely to state that the cracks which occur in the leaf scar tissue appear to afford the fungus a means of entrance.

An important and somewhat disappointing discovery was made during the year in connection with the time of infection. In the report of the preliminary spraying trial made on the Medaille d'or and Kingston Black crosses in December, 1919, it was mentioned that no information was available as to the time infection took place, although seeing that the 1919 wood was not infected at that time, it was presumed that infection took place during the late winter and spring. As a matter of fact the first case of bud infection on the 1919 wood was found on March 31st, 1920. Twelve days later many infections in early stages of development were found, and infection was evidently progressing rapidly. At that time the trees were just breaking into leaf and there appeared to be a definite correlation between the time of bursting into bud and of infection by the canker fungus. With regard to the present season's growth of these crosses, no bud infection has taken place up to the present time, and it appears that the period of infection does not start before the spring and proceeds actively when the buds are bursting. Unfortunately other varieties do not behave in this manner. As early as September 23rd, 1920, many of the leaves of the shoots formed in 1920 had fallen off especially on the varieties King of the Pippins and Devonshire Quarrenden. On these two varieties numerous bud infections were observed even before defoliation was at all complete. The autumn infection increases the difficulties of controlling the canker disease by spraying very considerably, although some results may yet be obtained with varieties which only infect during the spring.

A notable feature of the autumn infection was that as long as the leaves remained on the trees no infection occurred, a fact quite in accordance with the view expressed that the infection takes place through the leaf scar tissue. The time of leaf fall varied slightly in individual trees of the same variety, vigorous trees maintaining their leaves longer than others. This was strikingly illustrated

by the behaviour of two rows of trees of King of the Pippins—one row in one plantation defoliating late and remaining uninfected—another row of much older trees in poor condition early becoming heavily infected. Whether stock influence has anything to do with this result is unknown, but in any case the possibility of increasing the vigour of the trees by suitable manuring and so reducing the autumn infection of leaf scars appears to be worthy of consideration.

The result of applying spray last year was in some respects rather encouraging. Counts were made on May 19th, 1920, and showed that the total number of cankers which had developed on the 1919 wood of the sprayed branches was 62, whilst on the unsprayed branches 299 infections were counted. At this time the cankers were in a very early stage and probably many infections developed afterwards; a second count of the cankers on the same branches was therefore made on December 23rd, 1920, and it was then found that there were 179 cankers on the sprayed branches and 500 on the unsprayed. Before the spraying was done last year the cankers on the 1918 wood of the observed branches were counted. On the branches which were subsequently sprayed, 299 cankers were found, while there were 135 on the control branches.

There appears to be a decided decrease in the number of canker-infections as the result of spraying. The trees experimented with are seedlings and therefore vary individually, but the fact that the counts for the 1918 wood gave a considerably greater number of infections on the branches which were chosen for spraying somewhat discounts this objection. At any rate the results are regarded as sufficiently promising to warrant further trials on similar lines, and it is proposed to carry them out during the coming year.

#### *A BACTERIAL INFECTION OF PLUM TREES.*

*(S. P. Wiltshire.)*

In August, 1919, the trunk of a full sized plum tree, about seven years old, was received from Pershore for examination. The tree was diseased throughout the whole of the main trunk, the most badly attacked portion being about 3ft. 6ins. from the soil level. The cortex was killed and sunken over a very large area, which at one place completely girdled the stem for about 6ins. That the disease had been developing for some months was evident from the fact that no growth was made during the year 1919, and the renewed development of wood of the live portion frequently produced a

characteristic ridge between the dead and live areas on the outside of the stem. Four areas, scattered irregularly about the stem were noticeable bearing early stages of fructifications similar to those of a species of *Cytospora*. The largest of these areas measured 10cm. long by 4 cm. broad, the others being not larger than 4cms. by 2 cms. The stem was sectioned at six different levels, about 11cms. apart. Each section showed a considerable portion of the woody elements dead or dying, especially the three upper sections, where the wood was almost entirely browned.

Microscopic examination was made of the wood and cortex at the different levels. Both tissues were invariably infected by fungous mycelium—the cortical layers especially being heavily attacked. In many sections of the diseased cortex, however, certain gelatinous masses, with numerous small, rod-like bodies embedded in them, were also found, which strongly resembled small encapsuled bacteria.

A tree affected with a similar disease, in which bacteria were present in the cortex, was received by Mr. Spinks, two or three years ago, and during the past two years a number of trees have been attacked at this Station by a disease apparently similar in type. From six of these trees, bacterial like masses have been recognised in the cortex, together with very numerous fungal hyphae and in one case, fructifications of *Cytospora* were developed very extensively.

Of the six trees mentioned above, the first was a young half standard of the Kentish Bush variety, about three years old. The leaves were formed normally in the spring, but in June the whole foliage wilted suddenly, and was followed by the complete death of the tree, the leaves of which turned a deep brown and remained hanging on the tree. The root showed nothing abnormal, but the stem bore immature fructifications of a fungus similar to those of *Cytospora* a little above ground level. These fructifications were the centre of a sunken area about 27 inches in length, and which at the worst portion embraced two thirds of the circumference. Cross sections of the wood showed it to be almost completely diseased at the level of the fructifications, but 15 inches above and below the stem was quite healthy. Similar bacterial like masses to those before observed were present in the cortex, in addition, however, to numerous hyphae.

The second and third trees were Victorias about 5 years old and growing in the same row. The first signs of disease were noticed in July, when the leaves began to turn yellow. At that time the trunks were both heavily diseased throughout their length, and in

one case showed extensive pycnidial fructifications of *Cytospora* sp. The yellowing was followed by premature ripening of the fruit and early fall of the leaves. Bodies resembling bacteria in addition to numerous fungal hyphae, were found in each of the trees at the time when the first yellowing of the leaves occurred.

The fourth tree was of the variety Prince of Wales, and the only evidence of disease was a small sunken portion in the main trunk, extending from about 3 feet from the ground to the crown. No fructifications were visible, but on sectioning the cortex, numerous hyphae together with the same bacterial looking masses were recognised.

The fifth tree was also of the Prince of Wales variety and died off in the spring of 1920. Numerous bacteria and fungal hyphae were found in the main trunk and later the fructifications of the *Cytospora* appeared.

The sixth tree was on the variety Ickworth Impératrice, and died off during August 1920, in a similar manner to those recorded above. Masses resembling bacteria have been obtained from the trunk and branches of this tree also, and recently the fructifications of *Cytospora* have appeared.

In addition to these cases, various other specimens have been found to contain bacteria. Three specimens from Wales (which were kindly obtained by Mr. Wolf) each showed the bacterial like masses in the cortex. There appears to be no doubt that the occurrence of these suspicious looking bodies is fairly general in trees of various varieties affected with dieback.

At first these bacterial like bodies were regarded with great suspicion as it was thought they might simply be manifestations of gumming so common to injured plum trees. During the summer months by cutting off a slice of the diseased cortex of a suitable specimen, cream coloured masses of the reputed bacteria can be squeezed out from those tissues adjacent to the healthy stem. The shape and ready staining, and also their occurrence at the edge of the diseased tissue inclines one strongly to the opinion that they are bacteria. Many attempts to culture these bacteria have been made, but only during the last summer was any growth obtained which might be considered as likely to be that of the organism concerned. Until the organism has been satisfactorily isolated, cultured and inoculation experiments carried out one can only surmise as to its pathogenicity, although the association of the bacteria with the disease in such a number of cases is extremely suggestive and appears to be more than an accidental occurrence. The relationship between the bacterial organism and the fungus *Cytospora* is only a

matter of conjecture and the study of this fungus as well as the bacteria has been proceeding during the past season, with a view to determining what part each of these organisms plays in the disease.

#### *THE BARK CANKER DISEASE OF APPLES.*

(S. P. Wiltshire.)

During the past season an interesting disease appeared on apple trees in various plantations at Long Ashton. So far as is known the disease has not been recorded hitherto for this country, although it has been known to exist in the United States for some years. A brief account may, therefore, be of interest pending further investigation.

The disease is caused by the fungus *Myxosporium corticolum*, Edgerton. It attacks the main branches of the tree and produces large characteristic scars. These are long and may extend great distances along one side of a branch. The cortex over the scar is much sunken, and the edge of the scar sharply defined. The growth of the scar is marked by the formation of successive cracks and these developed at comparatively long distances from the edge of the infected tissue. By the growth of the scar the branch is surrounded and finally the top part dies away.

On the surface of the scar, numerous fruit bodies of the fungus are produced and in damp, foggy weather, the white spores of the fungus are found clustered together at the mouth of the fructification.

In America the disease is not regarded as being very serious as it appears only to attack trees which are in an unhealthy condition. The incidence of the disease at Long Ashton inclines one to this view also, although in those plantations where it has occurred it has done considerable damage, especially to the varieties James Grieve and Rival. The seriousness of the disease lies in the fact that the main limbs of the trees are destroyed and sometimes the whole tree is killed off. The latter is especially the case when the infection spreads from one branch to the head of the main trunk.

The entrance of the parasite probably takes place through wounds, as in many instances branches which have been headed back have become infected.

From the original description of the disease caused by this fungus, one gathers that the damage was confined to the outer layers of the stem, and hence the name of "bark canker" was given to it. This term is, however, rather misleading, as in the present outbreak the wood is discoloured for a considerable distance above and below the scar.

*A DISEASE OF MICHAELMAS DAISIES.**(S. P. Wiltshire.)*

The following brief note refers to a disease of Michaelmas Daisies which came under notice in the course of the Advisory Work of the Station during the past summer (1920). On account of the serious loss which it was causing to one of the large raisers of these plants the case was investigated in some detail. In due course a detailed description of the work will be published, but in the meantime this note may be of service as a guide to treatment of this disease which is evidently of common occurrence in one of the most popular and widely grown groups of plants now used for floricultural purposes.

The symptoms of the disease are as follows:—The plants break into strong growth in the spring and appear to be growing well. A number of shoots, however, in the early summer, when they have reached about a foot high, show a yellowing of the bottom leaves. These leaves turn brown and die off completely. The growth of the affected shoots is checked so that during the mid-summer they usually appear dwarfed, and also frequently show the premature formation of the inflorescence. Sooner or later the affected spike dies off. The result is the loss of a number of shoots which if allowed to remain show up as unsightly blackened withered shoots. Sometimes one single shoot of a plant will remain healthy while the surrounding ones die. One or two plants in a row may be affected whilst adjoining ones are healthy. After the dying back of the spikes, new growth may start from the ground once more.

The first specimens were received from Worcestershire, but since then the disease has been observed in two places in North Somerset and there is evidence that the trouble is widely distributed.

The disease appears to be due to a fungus of the *Fusarium* type, which lives in the tissues of the stem and root. The death of the shoots is due to the growth of the fungus in the water conducting tissues resulting in the stoppage of the water supply to the shoot which consequently wilts and dies off. Examination of the roots shows the presence of the fungus in the outer layers even when the external appearance of the root is quite normal.

A fungus has been isolated from the diseased tissues, and preliminary inoculation experiments indicate that it is the cause of the disease.

Before the control of this disease can be attempted intelligently, considerably more information will be required concerning the causal fungus. Attention to the following point, however, should prove of value—Michaelmas Daisies are propagated normally by

the division of the old roots. Stocks affected with the disease give out new roots which cannot be distinguished from those of normal healthy growing plants. The propagation of these infected stocks only serve to propagate the disease at the same time. Where the disease has only just made its appearance, of course it would be better to dig up infected plants and burn them, but when the plants are extensively diseased this procedure may not be deemed expedient. Plants suffering from the disease, however, should be carefully marked during the summer and even if allowed to remain should never be used for the production of new plants. An additional reason for this procedure is the fact that the disease may possibly be transmitted through the soil, and, by planting infected plants one not only serves to produce diseased progeny, but also bring about the infection of the soil against which treatment will be extremely difficult. At present this is the only recommendation which can be made beyond the burning of the infected material cut out of the affected plants and the vigorous enforcement of general plant hygienic measures.

#### *APPLE BLOSSOM WEEVIL.*

*(A. H. Lees.)*

During the last two years the ravages of this pest have been particularly marked. In the heavy crop of 1919, its effect was not in the majority of cases particularly harmful, since the thinning of fruits caused by it was of advantage rather than the reverse. In 1920, however, where the apple crop was light in districts unaffected by the insect, the extra thinning caused by it very seriously reduced an already too thin crop. It is safe to say that its attacks caused many hundreds of pounds loss to growers.

The broad outlines of its life history are well known. Thus the beetle, which is a typical weevil, that is a beetle with a long snout and certain other peculiarities, comes out of its winter quarters in the early spring and proceeds to drill a hole in the young unopened flower and to lay an egg in it. This hatches soon afterwards, and the resulting grub feeds on the stamens and ovules of the flower. This results in most cases in the failure of the flower to open or of the fruit to set, but occasionally in self-fertile varieties like Worcester Pearmain a set seems to be obtained before the style of the ovary is destroyed. Much more frequently, however, destroyed blossoms fail to open, turn brown and finally drop.



Towards the end of May the larva changes to a pupa inside the capped blossom, and a little later emerges in the beetle form. It is at this point that the information as regards its habits is obscure. Some authors have maintained that no feeding takes place during the summer, and that hibernation ensues later without any nutriment being taken. Others, on the other hand, have asserted that the summer weevils feed on the lower surface of the leaves: which, if either, view is correct is uncertain. The possibility of poisoning them with lead arsenate would, of course, depend on their habits and it is highly desirable that the point should be settled. It is hoped that information will be forthcoming next year from work now being carried on at Long Ashton.

As the autumn approaches the beetles begin to search out a suitable spot for hibernation. They are said to spend the winter in rough bark, beneath stones or under any rubbish on the ground. In a visit to an infected plantation at the beginning of October, 1920, it was only with the greatest difficulty that any could be found in the soil underneath the affected trees. Close by were some oldish plums, and in the old grease bands could be found a few specimens. A further investigation revealed a fair number in the cracks of the bark, but only on the old wood. If the wood was even moderately smooth none could be found. It was doubtless in the attempt to reach such cracks that a few had become caught by the old grease band. In larger numbers they were found sheltering under old grease band papers on some apples and here it was noticeable that if any were found, usually as many as fifteen or twenty were congregated together. They seem distinctly sociable. In this plantation a large number were found thus on the trunks of both plums and apples when the conditions were suitable, but of course, it does not follow that they may not select other positions, not so easily accessible, as well. They remain in hibernation till the following spring.

### *Prevention.*

It has been noticed that growers who lime spray thoroughly are far freer from attack than those who do not. The lime-spraying, however, might easily have two distinct and separate actions and to either or both the effect might be due. The coat that adheres to the trunk may completely seal the insects in and thus prevent their escape in the early spring, at a time when they would normally be on the move for egg laying. Or again there may be an indirect effect. Lime spraying usually delays the opening of the flowers.

for about a week. The insect lays its egg comparatively slowly, generally taking about three quarters of an hour over the operation. Further it will not oviposit in open flowers and therefore in a quick season the number of flowers attacked is comparatively small. A week in the spring often makes a considerable difference in the weather, and thus trees which are a week backward owing to lime-spraying may encounter much warmer conditions at the time of flower opening than would unsprayed ones. Thirdly the effect may be a mechanical one. The coating of lime may actually prevent the insect from getting at the flower in the required condition and by the time the lime coat has cracked the flower may be then already opening and therefore unsuitable for oviposition. It is hoped that in the course of work now in progress at Long Ashton, that these factors will be sorted out.

Even so, however, the process of lime-washing is an arduous and unpleasant one and an alternative method of control is highly desirable. Jarring the trees in spring has frequently been advised, but in the author's experience this practice has been attended with very disappointing results. It is possible that in the hands of others the method is more successful, but that no great success attends the plan would appear to be indicated by the fact that it is not widely used. Grease banding as a method of control also seems to be useless since the beetles readily fly in warm and bright weather though they are sluggish enough in cold and dull conditions.

Spraying with lead arsenate in the spring also seems of little avail. This is not surprising when one considers the very small hole made by the weevil for oviposition and the consequent very small amount of tissue that is gnawed. The covering would have to be very effective indeed, and the spray used at a great strength to get any marked poisoning effect.

There remains the method of trapping and it is possible that this may prove the easiest way on a commercial scale. The insect has a marked inclination to hide itself at certain seasons of the year and possibly this inclination might be taken advantage of. Some experiments done in the Tyrol about a quarter of a century ago seem to show that though a good catch may be obtained in traps in October, a far better one is got in May. The month of May would, of course, be the time when the new generation of beetles had come out. It is rather surprising to find that they are willing to go into hiding at that time of the year. The author has found them at that time, just below the soil, at the base of an apple tree running up and down the trunk, though limited in their wandering

by a grease band. It is possible that they feed during the summer and then retire to cover again. If this is their habit trapping in May should prove useful, since one would catch them before they had gone to some cover which could not be examined.

#### 4 METHOD OF IDENTIFYING REVERSION OF BLACK CURRANTS.

(A. H. Lees.)

“ My experience in inspecting growers’ plantations is that not one per cent really knows when a bush is reverted and when not.” Mr. W. P. Seabrook in the “ Fruit Grower,” November 4th, 1920.

With this dictum the present author heartily agrees. It is, of course, no discredit to the fruit grower that such is the case. There is undoubtedly great difficulty in identifying slight cases as the disease is very insidious in nature. In most diseases there is a distinct and well marked change in the appearance of the plant which soon makes itself evident even to the inexperienced eye. Thus a leaf attacked by mildew changes in colour from green to whitish, or by scab from green to blackish. One does not find for instance that a mildew causes a change of colour from green to light green, and then to greyish green and then gradually to white. The change is abrupt in the spots where the mildew has attacked and therefore identification is not difficult. The case is quite otherwise with reversion. In its initial stages there is no very obvious change in the colour of the leaf nor is there any very obvious change in the shape of the leaf. It is only after the disease has advanced to some degree of intensity that a change becomes noticeable to the uneducated eye. Even then the colour change is but slight and the chief difference is in the shape. In other words in most diseases the change induced is discontinuous in nature while in reversion the change is continuous and quantitative rather than qualitative.

These facts have made the identification of the disease from the growers point of view, a very difficult one and it is not surprising therefore, that most growers cannot recognise it until it has reached a comparatively advanced stage. Nevertheless it is obvious that it is extremely important that some method should be found that would enable anyone inexperienced in the disease to come quickly to a conclusion as to whether any given bush in his plantation showed signs of it or not. The great losses of crops entailed by it

\* This article has appeared in the *Journal of the Ministry of Agriculture*, and permission to reproduce it here almost simultaneously is gratefully acknowledged.

are well known and in the present state of knowledge as regards the disease the only methods open to the grower to curtail its ravages are propagation from sound stock and roguing. This latter process must be done both in his cutting beds and in his plantations in order to keep the disease in check.

The method about to be described has been tested during the 1920 season, and has been found to be uniformly reliable. It enables the observer to spot the disease in its earliest stages, and can be used as a means of identification from about the middle of May until the end of the season when leaf fall begins. On Plate IV. are figured seven leaves of the black currant. Fig. 1. is a perfectly normal leaf, while Figs. 2-7 represent various stages induced by increasing amounts of reversion. Confining attention for the moment to the normal leaf in Fig. 1. there are two main points to observe.

(1) *The Leaf Venation.*—The blackcurrant leaf venation is palmate in type. That is to say the chief veins spread out like the palm of the hand and in this case include five members. These veins all originate from the same point, situated at the extreme base of the leaf and run to the main points of the leaf, which for convenience have been labelled A, B, C, D and E. They may therefore be called main veins. The next point is to notice the number of subsidiary veins running from the median vein or midrib (that running to C) to points on the leaf margin. It should be noticed that since the vein running to D is a main vein, it is not counted amongst such subsidiary veins. The first one to count is the one immediately above it running from the mid-rib to the margin. In practice all the veins can be seen best from the underside. In Fig. 1, there are five of them numbered 1-5. Each of these may be called a submain vein and each ends in a point in the margin. It will be noticed that not all the points of the margin receive submain veins. As a matter of fact they are innervated by veins of a lower order which branch off from the submain veins. These, however, need not be considered as they are of no use in identifying the disease. The first character therefore in identifying the disease is that a normal leaf has at least five submain veins running from the midrib to a point in the margin. Sometimes the number may run up to seven, but it never descends below five. Usually the submain veins on each side of the midrib are the same in number though slightly different in position. It is immaterial which side is counted.

(2) *The Leaf Margin.*—The second point to note is the character of the leaf margin. In normal leaves such as shown in Fig. 1, the

margin is finely serrated, and there are quite a number of pointlets which do not receive a submain vein. This may, if necessary, be reduced to a numerical basis, though in practice it is not usually necessary to do so. Thus if one counts the number of pointlets not receiving submain veins between C and the sinus between C and D (marked X), one finds there are eight. Summing up, therefore, the characters that make a perfectly normal leaf are (a) at least five sub-main veins and (b) a finely serrated margin with many pointlets not receiving sub-main veins.

To bring out the points of difference it is best to compare a typical reverted leaf such as shown in Fig. 4. For convenience of reproduction only half the leaf is shown. This type is a very common one in reverted bushes and will be readily recognised by growers. Here the number of sub-main veins has been reduced to three, and the margin is noticeably coarse in outline. If one counts the number of pointlets between C and X, not receiving sub-main veins, one finds the number two as against eight in the normal leaf.

There are, therefore, well marked differences. So well marked are they that the practical grower may well say that he could tell the difference by eye, without going to the trouble of counting. Nevertheless the method has value as can be shown by consideration of the slighter cases of the disease. Figs 2-7 represent advancing stages of attack. While Fig. 1 is quite normal Fig. 2 is slightly attacked, Fig. 3 more so, and so on until an extreme type is reached in Fig. 7. At first sight Fig. 2 appears normal especially as it possesses five sub-main veins. The margin, however, is distinctly more coarsely serrated than Fig. 1 and has as a matter of fact only four pointlets between C and X which do not receive sub-main veins, as compared with eight in Fig. 1. It has, therefore, a distinct touch of reversion in its make up, and any bush having such leaves may be safely marked down as suspected. In Fig. 3 a further stage is represented, and here only four sub-main veins are found and the margin is still coarser, only two uninnervated pointlets being present between C and X. In Fig. 4, the next stage, only three sub-main veins exist and two uninnervated pointlets. Figs. 3 and 4 are very common types in cases of reversion and frequently no further stage in aberration of leaf type is reached. Sometimes, however, more extreme types are produced as in Figs. 5-7 where the sub-main veins are successively reduced to two and a doubtful, two and one. In Fig. 5 the third vein does not run to the margin, but is twined round in an inward direction. The uninnervated pointlets are reduced to zero in each case. Such types are frequently spoken of as "oak leaves" by growers. The term is a convenient

one to use, but it must be distinctly understood that they grade into the more ordinary types of reverted leaves and are only extreme cases of the same.

It will doubtless have been observed that in Figs. 1 to 4, there is a successive comparative elongation of the leaf. As a matter of fact this is usually taken as one of the characters of a reverted leaf by growers. The author, however, prefers not to lay emphasis on this character because, though frequently it is a reliable guide, a fuller examination of leaves in the field shows that it is not completely so. One can find cases where reverted leaves are quite broad in shape. The same applies to size. While it is perfectly true that in the majority of cases reverted leaves are smaller than normal this is not always so. For instance, if a reverted bush grown under good cultural conditions be cut down to the ground the growth made the following season has quite large leaves, which at first sight appear almost normal in shape as well, but their reverted state is quickly revealed by the method outlined above. Conversely small leaves are not necessarily reverted. Such leaves, really quite normal, are frequently produced at the beginning and end of the season.

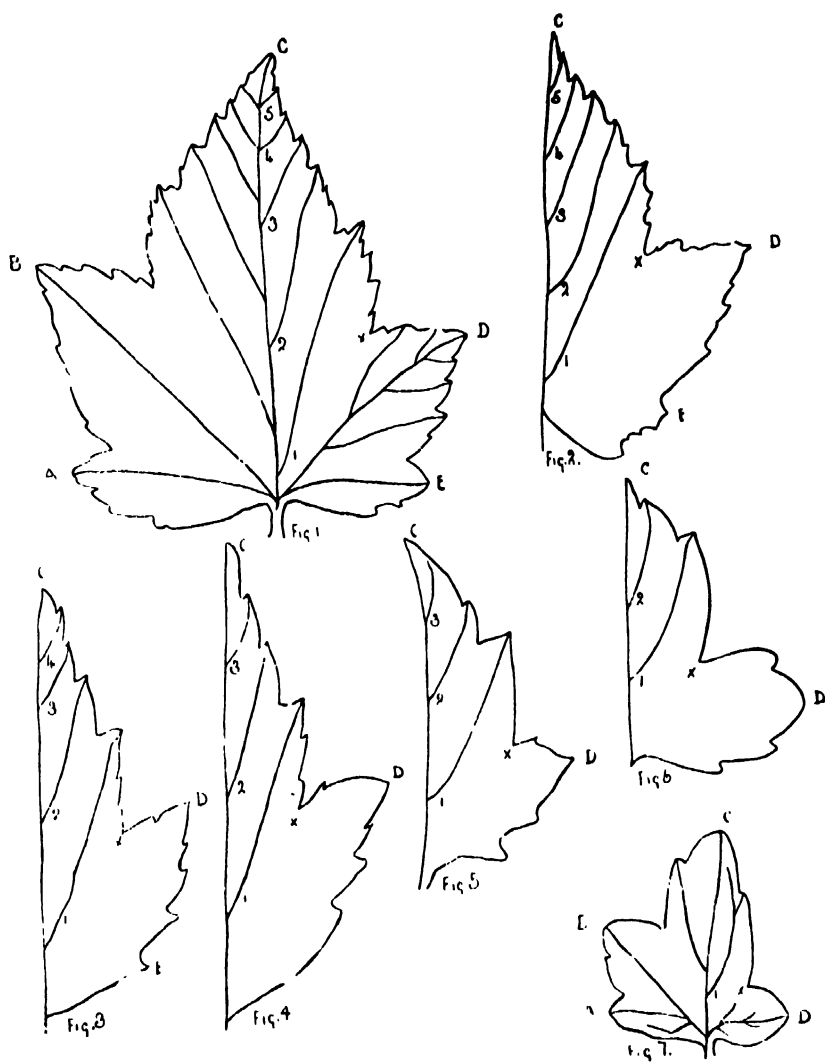
For convenience of comparison the points already discussed have been summarised in the following table.

The method of identification described above has enabled the course of the disease to be followed in considerably more detail and with greater accuracy than hitherto. The results obtained cannot be described here through lack of space, but they have shown that a reverted bush may start the season by producing perfectly normal leaves. This, however, does not continue long, perhaps only for a few leaves, but it means that in the early part of the season no attempt should be made to identify the disease by this method.

FIGURE.	NO. OF SUB-MAIN VEINS	CHARACTER OF MARGIN.	SERRATION	NO. OF UN-INNERVATED POINTLETS.
1	5	Normal	Fine	8
2	5	Slightly Reverted	Fairly fine	4
3	4	Reverted	Coarse	2
4	3	Reverted	Coarse	2
5	2	Intermediate Oak Leaf	Very coarse	0
6	2	Oak Leaf	Very coarse	0
7	1	Oak Leaf	Very coarse	0

By the middle of May, however, reverted leaves begin to show and this time until the end of June constitutes the period in

PLATE IV.







which the disease is most readily recognisable. This fact has long been known to practical growers who do their rogueing at this period of the year. It can, however, be done at any later period until the leaf drops, though the process is not quite so simple. In July or August the May-June leaves will not be showing at the top of the bush and since the reverted leaf type is most marked in May-June more care must be taken. However, in many cases the July-August leaves are also abnormal, though frequently only to the extent shown by Fig. 2. Nevertheless the grower who has trained his eye by the method described in this paper will soon be able to pick out such leaves. All he has to do then is to turn back the branches and look for the leaves produced in May-June. If reversion is present these leaves will show it quite clearly.

*Practical Conclusions.*—As mentioned above in the present state of knowledge as regards the disease the grower has two methods of attack. The first consists of propagation from sound stock. Now while nurseries in general do their best to send out sound stock, cases have been known in the past where reverted bushes have been received from firms of an established reputation. This statement is not made in destructive criticism as the author is fully aware of the great difficulties such firms experienced in ridding their stock of traces of the disease. But the risk still remains and is proved by the fact that no firm dare give a guarantee that the stock they send out is free from reversion. There is also a further point to consider and that is that in the present shortness of nursery blackcurrants, a grower cannot always obtain the variety he wants. It is therefore highly important that he should be in a position to propagate from his own stock should he wish to do so. In this case he should examine his bushes in June, and mark down individual bushes that are absolutely sound, as proved by the method described above. It is useless and dangerous to mark down blocks of bushes unless every bush in them is individually inspected, since in a block apparently normal to the eye, there are frequently some which show a trace of the disease. In the present stage of ignorance, therefore, it is necessary to be on the safe side, and only to use those that are beyond suspicion. Such bushes should be denuded of every scrap of wood that will serve for a cutting.

The second process of control open to the grower is that of rogueing. This should begin in the cutting beds and end in the plantation. Every year in June the cutting beds should be examined and every affected bush should be grubbed and burned. Exactly the same procedure should be adopted in the plantation

except that here, since the bushes are fruiting, they should be marked in June, for destruction after the fruit has been picked. The best method of marking such bushes consists of breaking one or more small branches in such a way that they are not completely removed, but that the dead leaves indicate the disease without materially interfering with the crop. By adopting such methods one large fruit grower has practically eliminated the disease from his plantations.

#### FRUIT BREEDING INVESTIGATIONS.

(*G. T. Spinks.*)

Fruit breeding work during 1920 has consisted mainly of the making of fresh crosses. Observations have also been made on the fruiting and other characters of seedlings raised in former years, but very few plants have come into bearing this year. In 1921, however, a number of young seedlings will have reached the fruiting stage. Brief particulars of the work done with each kind of fruit during the year are given under the various headings below.

**APPLES.**—The following crosses among others were made :—

Annie Elizabeth × Wellington	Devonshire Quarrenden × Cox's
Baddow Pippin × Cox's Orange	Orange Pippin
Pippin	Gascoigne's Scarlet × Wellington
Court Pendu Plat × Sweet Alford	King Edward VII. × Wellington
Cox's Orange Pippin × Allington	Lady Sudeley × Sweet Alford
Pippin	Ribston Pippin × Cox's Orange
Ditto × Beauty of Bath	Pippin
Ditto × Charles Ross	Stirling Castle × Wellington
Ditto × King of the Pippins	Sturmer Pippin × Sweet Alford
Ditto × Lady Sudeley	Warner's King × Wellington
Ditto × Lord Hindlip	Wellington × Charles Ross
Ditto × Reinette Obry	Ditto × Ecklinville
Ditto × Sweet Alford	Ditto × Golden Noble
Ditto × Wealthy	Ditto × Lord Derby.

Seed has been obtained from all these crosses, but no seed was obtained from several other crosses which were made, but not recorded in the above list. On the whole the set of fruit was fairly good, but a severe attack of aphid caused much of the fruit to be very poor and the seed to be small. Also it was found that many fruits which had set satisfactorily contained very few seeds, this being especially the case with crosses made in the open. It was very commonly found this year that fruit, whether the result of artificial or of natural pollination, contained very few seeds. Apparently pollination had taken place, but not satisfactory fertilisation of the ovules, probably owing to unfavourable weather conditions. A number of suggested crosses could not be made

owing to the widely different times of flowering of the varieties, and in future this difficulty will have to be overcome by collecting the pollen of the earlier flowering varieties, and keeping it until the later varieties are ready for pollination.

In making these crosses an aim has been made at definite desirable objects, including the production of a really good quality early dessert apple, a late dessert apple of good quality, and a good cooking apple which will be a late keeper. The desirability of heavy cropping qualities and resistance to disease are, of course, always borne in mind, and other qualities aimed at include a late flowering period, to secure immunity from frost, and such qualities as colour which are important from the marketing point of view. In breeding for dessert fruit Cox's Orange Pippin has been largely used as a parent in order to introduce the character of good flavour, while the other parent has been selected with a view to supplying the other desirable qualities. Wellington has been selected as the parent for providing high cooking quality in a culinary apple, and has been crossed with varieties which should supply various other characteristics which are wanted. Crosses have been made, or planned for next year, between market varieties and certain sorts of cider apples which are notable for their heavy cropping powers and their late-flowering habit: a cider apple of the sweet class, when used as a parent, may also introduce other useful qualities to a cross. Seed has again been obtained from open-pollinated fruit of several varieties with a view to raising families of seedlings of each of these varieties, as mentioned in this Report in 1919.

The seedlings from our older crosses, which have fruited before, have again borne fruit this year. The *Medaille d'Or* × *Kingston Black* seedlings have fruited well, some of them bearing heavy crops, and one or two may be of value as cider varieties. The inheritance of various characters is also of considerable interest. This year chemical analyses have been made of the fruit from each individual seedling, and the chemical composition of these fruits as compared with those of the parents is dealt with in another part of this Report.

There is at present nothing to report on the more recently made crosses, as none of the seedlings have yet come into bearing.

**PEARS.**—Pear crosses were made here this year for the first time. The following crosses were made, all in the open plantations :—

Catillac × Conference  
Ditto × Pitmaston Duchess  
Comice × Conference  
Durondeau × Conference

Louise Bonne × Conference  
Williams' Bon Chretien × Conference

As in the case of the apples, although the set of fruit was fairly good, yet the yield of seed has been very poor; fine large Catillacs have contained on the average only one fully developed seed in each fruit. In deciding on the above crosses the chief aim was that of combining good quality with cropping power. The production of a late-keeping variety of pear of commercial value is also being attempted.

**PLUMS AND CHERRIES.**—The following crosses were made in the spring of 1920 :—

Cambridge Greengage × Victoria	Heron × River's Early
Coe's Golden Drop × Victoria	Jefferson × Victoria
Curlew × Denniston's Superb	Pond's Seedling × Victoria
Ditto × Jefferson	Victoria × Pershore
Giant Prune × Victoria	Victoria × Purple Egg

A few other crosses were made on trees in the open, but unfortunately no fruit set owing to the occurrence of rain and very strong cold winds immediately after pollination. Most of the parents were selected with the idea of obtaining crosses between distinctly different types of plums. Attention is also being given to the desirability of producing new varieties which will flower late, crop well, and be resistant to disease, particularly "Silver Leaf."

Germination of the seed from the 1919 crosses has not been good, but a certain number of seedlings have been raised. The seeds of the 1919 cherry crosses all failed to germinate. The stones were sown without being cracked and several months later the shells, though intact, were found to be empty, and it seemed as though they had never contained any kernels. This was also found to be the case in 1916, but as none of the stones were cracked before sowing, either in 1916 or 1919, it is not certain that they really were unfertile.

**CURRENTS AND GOOSEBERRIES.**—The following blackcurrent crosses and selfs were made this year :—

Baldwin selfed	French selfed
Ditto × Seabrook's	Victoria selfed
Ditto × Victoria	Ditto × Boskoop
Boskoop selfed	Ditto × Seabrook's
Ditto × Seabrook's	

The Baldwin, Boskoop, French and Victoria bushes used in these crosses were true to the types as described in Mr. R. G. Hatton's classification, and were actually obtained from East Malling. Points aimed at in the raising of new blackcurrants are immunity

to big bud and reversion, and as usual, cropping power and other good market qualities.

A few of the oldest blackcurrant seedlings have now been selected for propagation and further trial, while the rest have been discarded. Various characters of newer batches of seedlings have been noted, but these are not yet old enough to enable a final selection of the best plants to be made.

The following crosses and selfs were made with gooseberries in 1920 :—

Carless selfed	Langley Gage selfed
Crown Bob selfed	Whinham's × Muttons
Ditto × Muttons	Whitesmith selfed
Keepsake selfed	Ditto × Muttons
Keepsake × Muttons	

It will be seen that in making the above crosses attention was largely concentrated on the endeavour to produce gooseberries immune to American Mildew, hence the use of the variety Muttons as a parent, as it is said that this variety is not attacked. Most of our gooseberry seedlings have not yet begun to bear fruit in any quantity, so that very little selection has been done from the older seedlings.

**RASPBERRIES.**—The following crosses of raspberries and other *Rubi* were made in 1920 :—

Alexander Autumnal × Royal	Park Lane × Royal
German Everbearing × Northumber- land Fillbasket Thornless	Ditto × Schaffer's Colossal
Ditto × Royal	Blowers × Taylor's Prolific
Ditto × Park Lane	Hoosac Thornless × Agawam
Northumberland Fillbasket Thorn- less × Royal	Kittatiny × Himalaya
Ditto × Schaffer's Colossal	Ditto × Taylor's Prolific
November Abundance × North- umberland Fillbasket Thornless	Rubus laciniatus × Himalaya
Ditto × Park Lane	Ditto × Loganberry
Park Lane × Northumberland Fill- basket Thornless	Taylor's Prolific × King's Acre Berry
	Ditto × Kittatiny
	Ditto × Mammoth

Seeds have also been obtained from selfed or open-pollinated fruits of the  $F_1$  plants obtained by crossing in previous years. During the fruiting season a search was made in the neighbourhood for really good wild blackberries, and four plants were selected. These will be propagated and tested and plants will also be raised from their seed. There should be a demand for a really good cultivated blackberry, and it is possible that some of these selected plants, or their seedlings, will be worth cultivating. In any case they will probably be useful as parents in making crosses.

The plants obtained from crosses made in 1916 have now fruited for three years and the best of them are being propagated for trial in larger numbers, while the rest of the  $F_1$  plants have been discarded. Attention is being paid, amongst other things, to the desirability of extending the fruiting season of the *Rubi*, and to the production of varieties with distinctive new flavours and other qualities which will make the fruit suitable for preserving and bottling.

STRAWBERRIES.—The following crosses have been made this year :—

Bedford × Keen's Seedling	President × Keen's Seedling
Duke × White Perpetual	Ditto × Maincrop
Earl × Unique	Ditto × St. Antoine
King George V. (Laxton's) × Black Prince	Queen × British Queen
Ditto × Duke	Reliance × Maincrop
Ditto × White Perpetual	Royal Sovereign × British Queen
La Productive × Keen's Seedling	Ditto × Keen's Seedling
Laxton's Latest × Black Prince	Ditto × King George V.
Louis Gauthier × White Perpetual	St. Antoine × Earl
Maincrop × Laxton	Vicomtesse × Earl
Ditto × Royal Sovereign	Ditto × King George V.
Monarch × Royal Sovereign	Ditto × Reward

The system is being followed of selecting for each desirable character one or two parents which have that character well developed. For instance, Laxton's King George V. is selected for earliness and Vicomtesse and Keen's Seedling for heavy cropping. Then each of these varieties is being crossed with several other varieties, which are notable either for the same character, in order to get that character intensified in the hybrids, or for other good characters, in order to obtain a new combination of good characters in the hybrids.

The plants from crosses made in 1916 or in earlier years have been reduced in numbers, only those being kept which appear to be worth further trial. These selected plants have been propagated by runners and at this stage five young plants from each selected seedling are being grown. After another two or three years the numbers of individual varieties will be still further reduced by selection, but the selected varieties will be tried in still larger numbers. Consecutive batches of new seedlings will be dealt with in the same way.

Plants from seed obtained in 1919 were planted out in the spring, but were not allowed to fruit this year, and they have made strong crowns which should fruit well in 1921.

TOMATOES.—A number of Tomato crosses were made in 1919, and an  $F_1$  generation was grown this year. Breeding work with

tomatoes is rapid, as a fresh generation can be raised each year.  $F_2$  plants obtained from seed of the self-pollinated  $F_1$  plants will be grown next year, and as some interesting results should then be obtained, details of the work will be reserved until those results are available. For the present it is sufficient to say that the  $F_1$  plants are on the whole intermediate in character between their parents; but as expected, some characters are dominant over others; for instance, red colour of the fruit is dominant to yellow colour. Also all the  $F_1$  plants from any particular cross appeared to be identical, which was perhaps to be expected as the parents breed true. Segregation of the various characters is to be expected in the  $F_2$  generation.

#### TRIAL CIDER ORCHARDS.

(T. Wallace.)

Owing to the failure of the apple crop during the past season, it was decided to postpone the proposed 1920 tour of inspection of the Trial Cider Orchards in Worcester and Hereford, until a more favourable cropping season, and consequently the work in this line during the past year has been restricted to the analyses of the soils of Monmouthshire which could not be completed in time for the 1919 Report.

The tabulated results of the analyses—mechanical and chemical—are given on Page 146.

An examination of the results brings out the following general points:—

#### MECHANICAL ANALYSES.

All the soils are derived from the Old Red Sandstone, and in consequence they show many points of similarity.

In general, three of the soils may be described as heavy loams and six as sandy loams. Except in one case (Tre Owen, surface soil) the predominant fraction in both surface soils and subsoils is the "Find Sand," which in the surface soils ranges from 39% to 23% and in the subsoils from 36% to 25%.

The "Fine Silt" fraction is always higher than the "Clay" fraction.

#### CHEMICAL ANALYSES.

*Organic Matter.*—For pastures, the amount of organic matter as shown by "Loss on Ignition" is generally on the low side, ranging from 4.3% to 8%.

*Lime.*—The soils are generally deficient of lime. In six cases the surface soil and subsoil have "Lime Requirements," and in two

of these surface soils, the acidity is equivalent to approximately 7 tons of calcium carbonate per acre.

In the three soils in which lime is present, the amounts are small, especially in the subsoils and it is evident that the lime has been "added" in the past.

It seems remarkable that the trees should have done so well on these acid soils, and it is hoped that we shall be able to carry out some "liming" experiments to see how much the trees benefit by "liming."

*Phosphoric Acid.*—The "Total" Phosphoric Acid is never high, being generally low, especially in the subsoil where in six cases there is less than 0.1%  $P_2O_5$  present.

The "Available" figures are also generally low excepting at "Sunny Bank" where the orchard has had dressings of farm yard manure.

*Potash.*—Except in two cases, the "Total" Potash is generally high. An interesting point is brought out in comparing the "Total" Potash figures in the surface soils and subsoils. Of the eight cases available for comparison, in four cases the "Total" Potash is higher in the surface soils than in the subsoils,\* in one case the amounts are equal and in three cases it is higher in the subsoils than in the surface soils.

In this connection, it will be seen that in the latter three cases the soils are of the heavier type whilst the remaining soils are of the lighter type.

The soils are discussed in detail below.

*Llansaintfraed.*—The surface soil only of this orchard was examined. This soil is a light sandy loam typical of the Old Red Sandstone and is similar in texture to the lighter soils of the Research Station. The acidity of the soil is equivalent to 4 tons of calcium carbonate per acre. It would probably respond to "liming" and general manuring.

*Tre Owen.*—The texture of this soil is good, although the percentage of "Fine Silt" is rather high. The "Available" Phosphoric Acid and Potash are low both in the surface soil and subsoil. No doubt the soil would respond to phosphatic manures and probably to potash. A dressing of slag should be tried. Both surface soil and subsoil are acid.

\* C. V. Lydney Soil, Old Red Sandstone, 1919 Report, Trial Cider Orchards.



*Itton Court (Cider Orchard).*—The soil is a heavy loam, and where it is of sufficient depth the trees are doing well. At some points in the Orchard, the soil is only 6-8 inches deep and overlies a sandstone bed. In these latter places the trees are suffering from canker. This soil would probably respond to slag.

*Itton Court (Perry Orchard).*—The trees in this orchard are "doing" badly and the trouble is probably due to the texture of the soil. The "Mechanical Analyses" of the surface soil and subsoil show that the soil consists mostly of stones, gravel and sand, the proportion of the finer fractions present being very small. The trees do not appear to be able to obtain a firm "rooting" in this open soil, and it is doubtful whether intensive manuring will overcome the physical defects of the soil.

*Tyllwydd.*—This soil is a heavy loam of good texture. With the exception of the "Total" Potash, the food supply in this soil is very low and it would doubtlessly respond to liberal manuring. It has been found to respond to slag and superphosphate, but in view of the fact that the soil has an acid reaction, dressings of slag only are to be recommended. Heavy dressings of this manure should be given.

*Sunny Bank.*—This soil, the texture of which is on the coarse side, contains rather high amounts of "Stones" and "Coarse Sand" in proportion to the amount of "Clay" present. At one end of the orchard, the soil is also very shallow and here the trees are not "doing" so well, being subject to canker. The soil has been dressed occasionally with farmyard manure. Both the surface soil and subsoil have very high "Lime Requirements," viz., *Surface* equivalent to 7 tons of calcium carbonate per acre. *Sub* equivalent to 4 tons calcium carbonate per acre.

*Croesheolydd.*—This soil is a sandy loam containing a rather high proportion of "Coarse Sand" in both surface soil and subsoil, and has "Lime Requirements" very similar to those of Sunny Bank. This soil would probably respond to liberal manuring.

*Llanddewi Court.*—The soil is a sandy loam of fairly good texture. The "Available" Potash is low in both the surface soil and subsoil. The soil has an acid reaction. A dressing of lime should be tried.

*The Hendre.*—The soil is a heavy loam, similar in texture to Tyllwydd and Itton Court (Cider Orchard). The "Total" and "Available" Phosphoric Acid are low in both surface soil and subsoil (c.v. Tyllwydd), and the soil would probably respond well to liberal dressings of slag.



## CHEMICAL ANALYSIS

<i>Surface Soil.</i>									
Moisture	%	%	%	%	%	%	%	%	%
Loss on Ignition	1.60	1.85	2.79	1.99	1.64	2.20	2.11	2.17	1.97
Carbonate of Lime	6.31	7.41	7.86	7.64	4.35	7.49	8.40	7.02	6.10
Phosphoric Acid (Total)	Nil	Nil	0.351	0.124	Nil	Nil	Nil	Nil	0.429
Ditto (Available)	0.102	0.132	0.136	0.126	0.070	0.195	0.189	0.111	0.0811
Potash (Total).	0.0160	0.0079	0.0128	0.0198	0.0078	0.0345	0.0224	0.0145	0.0107
Ditto (Available)	0.568	0.700	0.841	0.387	1.02	0.569	0.357	0.574	0.848
Lime Requirement	0.0101	0.0095	0.0143	0.0178	0.0095	0.0163	0.0192	0.0041	0.0133
	0.401	0.328	Nil	Nil	0.146	0.693	0.675	0.211	Nil
<i>Sub Soil.</i>									
Moisture	..	1.22	2.98	1.29	1.51	1.63	1.40	1.42	1.95
Loss on Ignition	..	4.40	4.08	4.16	4.27	4.18	5.11	4.50	4.28
Carbonate of Lime	..	Nil	0.050	0.041	Nil	Nil	Nil	Nil	0.164
Phosphoric Acid (Total)	..	0.0841	0.079	0.0872	0.070	0.20	0.148	0.0865	0.0479
Ditto (Available)	..	0.0024	..	0.0125	0.0080	..	0.0154	0.0107	0.0063
Potash (Total).	..	0.581	1.052	0.372	1.29	0.552	0.357	0.556	1.01
Ditto (Available)	..	0.0094	..	0.0159	0.0091	..	0.0105	0.0053	0.0065
Lime Requirement	..	0.128	Nil	Nil	0.091	0.405	0.401	0.190	Nil

## SPRAYING TRIAL FOR CONTROL OF LOGAN BEETLE.

(A. H. Lees and G. S. Peren.)

The logan and raspberry beetle, *Byturus tomentosus* is the most serious trouble that the logan grower encounters and is the most usual cause for grubbing otherwise fruitful plantations. The beetle hibernates in the ground and appears above ground some week or two before the first logan flowers appear. As soon as the flowers open they enter them, often pairing in this position. Eggs are laid here and the resultant grub bores into the receptacle of the fruit. Its activity causes the fruit to slow down its growth and to become distinctly deformed in shape. As the berry grows the grub usually breaks into the fleshy portion of the drupels frequently rupturing the skin in the process. As soon as this occurs the fruit rapidly loses water through evaporation and consequently dries up. Its decay is frequently assisted by various flies which, as they suck at the open wounds, doubtless leave their quota of saprophytic organisms in exchange for their meal. The direct and indirect damages caused by the beetle comprise loss of size, shape and weight beside seriously injuring the canning quality. It is therefore a serious pest. So far no satisfactory commercial method of control has been found. Like most beetles it is very hard to kill with contact washes or powders. It is comparatively easy to anaesthetize it or to cause it to feign death, but to kill by such measures is very difficult.

In order to test whether it were possible to control it by spraying with lead arsenate a small trial was conducted in 1920 at Long Ashton. Soap was added to the arsenate in order to obtain rather better penetration into the flowers, where it was necessary to lodge the spray. In this case no scorching was obtained from the combination, though P. J. Fryer has shown that when the arsenate is not strongly basic or when the soap is rather strongly alkaline such scorching is almost bound to occur.

The following data refer to the arrangement of the experiment.

## FORMULA.

Arsenate of Lead	...	...	...	6 lbs.
Soft Soap	...	...	...	10 lbs.
Water	...	...	...	100 gallons

Pressure of application 125 lbs. per sq. inch.

First application: May 19th.

Second application: May 27th.

The object was to perform the first spraying when approximately 2/5ths of the blossom was out, the second when approximately 4/5ths of the blossom was out. The endeavour was made as far as possible to spray right into the flowers.

There were twelve rows of logans. Half of each row was sprayed and half left unsprayed. The plantation had previously been under a cultural experiment, and for this purpose had been divided into four portions consisting of rows 1-3, 4-6, 7-9 and 10-12. In order to find the results of spraying, if any, the middle rows were selected for counting, namely, 2, 5, 8 and 11, and as many berries from the rows as possible and as frequent pickings as possible were counted. In Table I. the results are set out under the different rows. The percentage of infected berries (right hand columns), varied from 19-28 for the non-sprayed, portions and from 11-22 for the sprayed portions. Totally, all the figures gave 15% for the sprayed portions against 24% for the unsprayed, showing a reduction of 9% or rather over half. The reduction is therefore clearly marked and shows that the spray had some effect, though the amount is somewhat disappointing.

In the second table the percentages of infected berries are calculated for each picking for both sprayed and unsprayed portions of all four plots.

TABLE I.  
INFECTED BERRIES (percentages).

DATE OF PICKING.	Row II.		Row V.		Row VIII.		Row XI.	
	SPRAYED.	NOT.	SPRAYED	NOT.	SPRAYED.	NOT.	SPRAYED.	NOT.
June 28 . .	18	15	..	..	..	..	..	..
June 30 . .	12	9	8	14	4	16	8	7
July 5 . .	8	22	5	15	..	..	..	..
July 12 . .	20	41	20	33	19	28	13	25
July 26 . .	37	65	41	31	36	41	21	20

It is clear from these figures that in the nonsprayed portions there is a well marked increase in the number of infected berries as the season advances. This is due to unknown causes, but may be attributed to the increasing number of beetles that come out of winter quarters as the season progresses. There is also a slight indication in row II of a reduction due to natural causes for the date of June 30th, but this is not sufficiently supported by figures to be reliable. The figures for the sprayed portions follow the general trend of the non-sprayed, but they are in nearly every

TABLE II. SHOWING NUMBERS OF SOUND AND INFECTED LOGANBERRIES.

II			V			VII			XI			TOTAL			
SPRAYED.	NOT.		SPRAYED.	NOT.		SPRAYED.	NOT		SPRAYED.	NOT.		SPRAYED.	NOT.		
Sd. Inf.	Sd.	Inf.	Sd.	Inf.	Sd.	Inf.	Sd.	Inf.	Sd.	Inf.	Sd.	Inf.	Sd. Inf.		
58	14	96	84	7	156	26	110	5	124	23	55	5	139	10	
93	19	85	14	264	306	54	85	20	75	29	83	12	241	80	
111	15	59	6	24	86	42	107	59	78	54	66	18	138	35	
299	25	244	68	30	19	62	28								
61	15	104	73												
33	19	36	66												
655	107	624	245	402	46	610	150	302	84	277	106	204	35	518	125
14%			28%	11%		20%	22%	28%	15%	19%		15%			24%

case markedly less. They also show a reduction for July 5th, which goes against the direction of the unsprayed portions. This may therefore be put down to the effect of spraying. The conclusions therefore that may be drawn from the experiment are as follows :—

- (1) That spraying reduced the total percentage of infected berries from 24 to 15.
- (2) That the number of infected berries in the control portions increased markedly as the season progressed.
- (3) That the effect of spraying was less marked as the season progressed.

This would indicate the desirability of a third spraying.

#### *FACTORS GOVERNING FRUIT-BUD FORMATION.*

*(B. T. P. Barker and A. H. Lees.)*

#### IV.—PRUNING.

##### *A. THE LORETTE SYSTEM AS APPLIED TO ENGLISH CONDITIONS.*

The last two articles of this series (II and III) treated respectively of “ the normal phase of growth ” and “ the effects of ringing and notching.” The subject of pruning follows in natural sequence. It is altogether too large and too complex to be dealt with adequately within the limits of a single article, and much further experimental work is necessary before it can be profitably considered in a general way. The kind of response a tree makes to any form of pruning is determined by the combined action of numerous factors and these operate in varying degrees under different conditions. Often rules that suit one place or variety are unsuited to another place or variety. To place pruning on a scientific basis the principles underlying the process must first be elucidated. Then it should be possible to lay down general rules capable of modification for different conditions.

Primarily pruning consists in the removal of complete portions of the tree in such a way as to interfere with its normal course of growth and intelligent pruning aims at causing a desired proportion of the remaining buds to develop into flower rather than wood buds. In the case of the apple and pear there is no special time at which the operation must be done. Both winter and summer have their advocates, and pruning at any time will produce in a healthy tree some reaction, though this may and will vary according to a number of conditions.

Previous experience has shown that attempts to advance the knowledge of the subject by the method of set pruning experiments or tests of one system against another have failed to strike at the heart of the subject because attention has been focussed on the response of the tree as a whole to the combined influence of the individual factors which come into play. Their joint force is necessarily a variable one, determined by the local conditions prevailing during the course of the experiment. At Long Ashton a different method is being adopted, which consists essentially in a study of the interplay of the various factors concerned when a definite form of treatment with a specific object is adopted.

The various divisions of the present article are limited therefore to a consideration of certain processes of pruning in so far as they modify fruit-bud formation only, and secondary and tertiary effects are neglected. The processes treated on this occasion constitute the Lorette system. It has been selected for prior consideration, partly from its inherent interest, partly because many growers have expressed the desire for a short account of it in view of its bearing on their practical methods, and partly because it serves as a convenient starting point for further discussion of the problems of pruning generally.

#### SECTION I.—THE LORETTE SYSTEM OF PRUNING.

“La Taille Lorette” was the title of a book, the first edition issued in 1913 and the second in 1914, giving the results of the author over a period of years. The book itself is distinctly difficult to understand, though this is not so much due to the fact of its being written in French as that the arrangement of the matter is faulty. Sometimes indeed one is tempted to think that there is no arrangement at all and the reader may easily become greatly confused as to the real meaning of the author. The position is rendered still more difficult by the fact that there is no recognized translation for many of the technical terms. Nevertheless an effort has been made here to give the gist of Lorette’s directions in so far as they affect flower production as distinct from training and, if errors have crept in, they are due to the difficulties above outlined. It may be mentioned at once, so as to dispose of the subject, that his directions for training trees are not likely to be of much assistance to commercial fruit growers, since in nearly every case some sort of supporting structure is specified. There is, however, one exception and that is the “fuseau” or “distaff” form which, quite conceivably, may oust



the cordon, since no support is necessary and fruit is obtained only one year later and then in greater quantity. In this article, however, this form will not be considered.

Lorette aims at producing his flower buds and spurs only on main supporting branches. Any twig or branch of a wood-shoot nature that does not definitely extend the intended frame work of the tree has to be treated in some way or other to induce it to change into or produce flower buds. He admits of no secondary or breast wood in the ordinary sense and his system must be classed as a spur system. He is thus always striving to make the tree consist of the two types of shoot, viz., supporting branches and spurs. (As an amplification of spurs in the ordinary sense are his "coursounes" which are, however, roughly only what are generally called compound spurs. All his intermediates are temporary forms.)

At present a few commercial growers practise a spur system, but such methods have generally been considered by many to be more suitable for amateurs' gardens than for commercial plantations on the supposition that more labour is entailed. Most growers leave intermediate or secondary small branches where there is room for them under the idea that they will fruit naturally. They do sometimes. Often, however, flower buds only form at the terminal and the resultant fruit may then, owing to winds, be knocked off prematurely. In many cases, however, these secondary branches end in a wood bud and simply continue wood growth the following year. In certain cases the practice may be justified, especially in certain varieties for definite purposes, but its general practice causes the bush to lose definite shape and no distinction can then be made between supporting branches and secondaries. The final result is that these secondaries usurp the function of supporting branches, but they are in an entirely wrong position for carrying on this function. Lorette himself does not consider the bush form to be acceptable, but since there is general agreement amongst English growers that it is a desirable form, and since it has many practical advantages, it is necessary to consider how far Lorette's flower production methods can be applied to it. The junior author has grown bush apples in his own garden for five years under Lorette's treatment and is entirely of the opinion that the general method, with modifications, is quite suitable. The question is, of course, to some extent necessarily bound up with training, but for the sake of clearness this need not be discussed here. One must presuppose that conditions of light and supply of crude food are satisfactory and then the problem simplifies itself into how to change

wood shoots other than those destined to form supporting branches into spurs. By a spur is meant a short shoot bearing one or more flower or intermediate buds (dards).

First of all Lorette lays importance on the cutting of the leaders when the "sap is in motion," and for pears, of which his book chiefly treats, the date comes generally some time in April. He maintains that better results are obtained in this way, especially as regards stimulation of the more dormant buds at the base of the leader.

His rules for subsequent treatment may be laid down as follows. It must be remembered that they apply to pears and that for apples the operations have to be done about three weeks later.

All cuts of shoots that are not leaders are made with secateurs. Leaders are not cut after the April-May prune.

#### *I. Treatment of Wood Shoots.*

(a) *Of one year's growth only (namely shoots which arise directly from a supporting branch and thus consist of current year's growth only), when these are*

- (1) *about the thickness of an ordinary lead pencil at the base;*
- (2) *about 10-12 inches long, and*
- (3) *just beginning to lignify at the base.*

*Cut to "empâtement."*

Of these three methods of telling whether an ordinary shoot is ready for cutting the third is far the most important. In practice one finds that, except in particularly strong varieties, the shoot when ready for the operation is slightly less than pencil thickness. The length also varies. Thus in really weak growers the shoot is suitable long before it is ten inches in length. The third method, however, is a safe criterion. It must neither be green and sappy nor hard and woody, but just in between. The first two methods apply to training much more than to flower production. In Lorette's book they are confused, but those who have talked with him say that the third criterion is by far the most important when pruning for flower production.

"*Cut to empâtement.*" According to Lorette's figures this means cut to the one or two leaves at the base. In another part of his book he clearly says that a centimetre of tissue must be left. In yet another he defines the operation as a cut "*au-dessus les folioles.*" The "*folioles*" are the leaves at the base which do not contain a visible eye at the time of cutting. The cut to "*empâtement*"

thus becomes a cut just above the highest leaves not containing an eye at the time of cutting. In many parts of his book he emphasizes the importance of this cut in developing the stipulary eyes. These are paired dormant eyes on each side and at the base of the primary shoot. Here again there is confusion. Apparently they are to be developed when one is following his advice for training specimens. For flower formation they are not so important, though if they develop as the result of a cut they are useful. Two persons who have seen him separately, state that it is the "basal cluster" that he really advises for pruning to.

The term "basal cluster" requires some explanation. If ordinary wood shoots of an apple or pear be examined in the middle of summer it will be found that in most the leaves are more crowded at the base than elsewhere. Often in the first inch or so there are as many as five leaves, whereas on the higher parts of the shoot they average perhaps one per inch. This cluster of leaves at the base goes by the name of the "basal cluster." In other shoots, however, the "basal cluster" can scarcely be recognised, the base of the shoot having the appearance of having being pulled out longitudinally. All kinds of intermediates may be found between the well developed "basal cluster" and no cluster at all. The leaves of the "basal cluster" have no visible eye at the time of pruning and so Lorette's rule comes down to this:—*prune to the "basal cluster."*

In the pear the first of such shoots to require attention are those immediately behind the pruning cut of the leader and the time, the middle of June. If secondary wood shoots arise from stipulary eyes or from the "basal cluster" they are cut in the same way in July-August, and tertiary, if any, in August-September.

Most of the wood shoots will not be ready for cutting until the end of June. Secondary and tertiary shoots are treated as above in July-August and August-September.

[NOTE.—If wood shoots do not attain pencil thickness by the end of June (for pears) a different treatment is given. Such shoots are cut to three leaves possessing eyes. Usually the two top buds grow out. When the top shoot is 10-12 inches long it is completely removed and the second shoot is cut to "empâtement." The third eye then changes to a "dard" (intermediate bud between wood and flower).]

(b) *Of more than one year's growth (namely shoots not arising directly from a supporting branch, but a short piece of wood of one or more year's growth).*

*Leave one wood shoot (the weakest) and cut it to one visible eye.*

These are, of course, wood shoots growing from shoots treated in previous years. The whole organ therefore consists of the current year's wood growth and, at its base and bearing it, wood of an older year or years. This older wood will in nearly every case bear either developing flower buds or dards or both.

The wood shoot is cut to one visible eye. This eye acts as a sap drawer to prevent the dards or developing flower buds behind being pushed out into wood growth. If more than one such wood shoot is present, remove completely all except the weakest, which treat as above. If at any time a well-formed dard should grow into a wood shoot, cut right back to its basal cluster. Time of treatment about the end of June. In August–September remove all stubs of such cut shoots leaving only flower buds and dards.

## *II. Treatment of Spurs.*

*Leave if no wood shoot present. If present cut as in I (b).*

A treated wood shoot of the previous year really becomes an incipient spur and it is difficult to say where one grades into the other. Such a shoot in the second year may or may not possess developing flower buds, but it certainly should possess dards.

## *III. Treatment of "Brindilles" or Twiggy Shoots.*

*Cut to three eyes or bend downwards.*

Lorette defines a "brindille" as "a slender branch crowned with a rounded eye which bears fruit." There seems, however, some vagueness as to his exact meaning. Sometimes he uses the term in this sense and sometimes he applies it to any long thin twiggy shoot, even if its terminal is a wood eye. According to him they are unsuitable for cutting. These should be left to fruit in young and vigorous trees, but in fertile and less vigorous ones they should be cut to three eyed leaves at the end of June, as in I (a) Note. In another place he recommends bending such twigs downwards by an attached weight and partially cutting through the stem with an oblique cut between the third and fourth leaf. This operation is supposed to make the basal buds break.

## *IV. Treatment of "Bourses" or Knobs.*

*Cut wood shoots arising to the basal leaf or to two visible eyes.*

When a flower is fertilized and sets fruit the portion of the plant tissue bearing the stalks enlarges (especially in the pear) to form the structure called a "bourse" or "knob." It develops two eyes, one on each side and one nearer the fruit than the other. These are, of course, the eyes that in an old tree develop naturally into flower buds for a subsequent season.

If wood shoots develop from the bourses they are treated as follows :—

- (a) If no dards are present on the bourse, or if these dards only have 3-4 leaves, cut the wood shoots when 5-6 inches long preserving the leaves at the base.
- (b) If dards with more than four surrounding leaves are present leave one sap drawer only, which cut to two eyed leaves. Both (a) and (b) are treated in early June.

#### *V. August-September Treatment.*

*In August-September remove all stubs derived from previous prunings and leave only flower buds, dards and brindilles.*

There are thus no wood shoots remaining except those which are forming supporting branches.

The following calendar for pruning operations on the pear, according to the Lorette system, is adopted from the one in his book.

APRIL ... Cut leaders.

MAY ... Thin fruit, leaving only one per truss.

JUNE ... Cut back wood shoots from the " bourses " according to directions.

Cut back strong wood shoots just behind pruning cut of leaders leaving about 1 cm. and preserving the " folioles."

JUNE-JULY ... Cut back most of the wood shoots which had not attained the proper condition in June.

Cut thin ones to three eyes.

Cut back wood shoots from spurs or fruiting branchlets (coursonnes) to one eye if dards or developing flower buds present below ; otherwise to cluster.

JULY-AUG. ... Cut back to cluster secondary shoots derived from wood shoots cut back at the first pruning.

AUG-SEPT. ... Cut back tertiary shoots, if any, but not if they are feeble. Cut out all stubs from previous operations leaving only flower buds, dards and brindilles.

## SECTION II. SURVEY OF RESULTS UNDER LONG ASHTON CONDITIONS.

In the summer of 1915 the junior author began to put Lorette's principles into practice on some bush and cordon apples and pears at Long Ashton, and the following criticisms are based on the

experience thus gained. He alone is responsible for them, and his results refer, unless otherwise stated, to Long Ashton conditions. It may be pointed out that these conditions differ from those of Worcestershire and Herefordshire, and still more from the East of England, in being markedly wetter. The probable influence of these conditions is discussed in a later portion of this paper.

1.—*The Importance or otherwise of Pruning Leaders in April.*

Lorette lays great emphasis on pruning leaders of pears and apples when the "sap is moving." This period for pears falls in April, and for apples about three weeks later. The criterion is that the lateral buds on the leaders should have made two inches of growth. He maintains that pruning at this late date causes a better "break" of buds from the basal part of the shoot than would otherwise be obtained.

These basal buds are always weaker and frequently require some extra stimulation to cause them to leave their rather dormant state. In ordinary winter pruning one finds that the harder the prune the more the basal buds tend to break, but on the whole fewer buds break. Thus if an unpruned shoot possessed 15 buds and 5 were removed in pruning something like 6 of the remaining 10 might break leaving 4 dormant. If, however, 10 buds were removed leaving only 5 probably 3 would break strongly and 2 remain dormant. Thus the harder the prune the fewer the dormant buds at the base, but also the fewer that actually break. In the light prune there would be 6 buds breaking and 4 dormant, in the hard prune 3 breaking and 2 dormant. If the shoot therefore is left unpruned till April, it will break as an unpruned shoot, i.e., there will be the maximum tendency for dormant buds. Therefore if Lorette's contention is to be maintained the better break should be obtained after his April prune. That is to say, after the prune there should be some evidence that the basal buds are given an extra stimulation. To prove the point, several pear shoots were pruned according to his directions and the position of the last basal bud to break carefully marked. No further basal buds broke as the result of the pruning cut nor were those weak basal ones that had already broken, at all stimulated. The result appeared therefore to be nil and in no way superior to what could be obtained by doing the same pruning in the dormant season. In two special cases, however, some such effect as Lorette contends do occur. The first may be got when a leader is cut back in April or early May, right behind any visible green bud on to bare wood. In this case a number of dormant eyes may be made to break. A

somewhat similar stimulation, but this time of basal buds that are already incipient dards, can be obtained if a leader is cut to a bud that is itself nearly quiescent as regards growth. This can be done in May, by which time the dards at the base of last year's wood growth have practically closed buds. Before the new terminal is forced into new growth the buds behind have been measurably stimulated. It must be noted, however, that in each of these cases the new terminal is in an inactive or quiescent condition, whereas in the usual Lorette practice it is quite open and actively growing.

## 2.—*Pruning the Wood Shoots to "Empâtement."*

In the first two years of experiment at Long Ashton, Lorette's book directions were followed and the cut made to one or two basal leaves leaving 1 cm. of unpruned tissue as directed by him. The results were often very bad. Five possible things happened.

- (a) Stipulary eyes developed and grew into dards. (Quite seldom.)
- (b) Stipulary eyes developed and grew into thin wood shoots. (Frequent.)
- (c) No stipulary eyes developed. Eye in axil of one of the basal leaves grew into dard. (Infrequent.)
- (d) No stipulary eyes developed. Eye in axil of one of the basal leaves grew into thin wood shoot. (Frequent.)
- (e) No stipulary eyes developed. No eye in axil developed. Spur died. (Very common.)

Thus only two out of the five possibilities, (a) and (c), gave satisfactory results and these were of infrequent occurrence. Generally no bud at all developed and the spur died in consequence. The thin wood shoot obtained in many cases, especially in a wet season, is very difficult to deal with if there is no developing dard behind it, because its own basal buds are all so weak as to be practically non-existent.

These failures may be ascribed to faulty directions of the book. The "basal cluster" idea is a much better one, though even this sometimes requires modification. According to Lorette when a shoot is pencil thickness and beginning to lignify at the base and about 10-12 inches long, it may be cut to the "basal cluster". At Long Ashton, however, shoots of the right length, thickness and woodiness at the base very frequently have no basal cluster or a very poorly defined one. In fact most of the shoots produced here

are of that character. Lorette gives no guide as to what to do in these cases. Probably under his conditions he had none or very few. There is no cluster to cut to, and if one cuts them to one centimetre as advised the spur usually dies. Much more satisfactory results can be obtained if the position of the basal leaves is taken as the criterion of where to cut, the time for cutting the majority of shoots being fixed for the end of June for pears and about July 20th, for apples. Then in the few cases where a basal cluster is well-developed a cut may be made to this point. Even then some failures resulted. Where the basal cluster is poorly developed or absent the best method is to cut to two visible eyes. If cut to one only, this bud develops into a thin wood shoot and no buds start behind so that nothing is accomplished. In the case of the cut to two buds, however, the top develops into a thin wood shoot and the bottom one into an incipient dard. In the Long Ashton climate two buds very seldom grow out, so Lorette's method of cutting to three (as in the case of weak wood shoots) has to be modified to two. Occasionally, however, when the wood shoot is especially strong or in a favourable position (just below an extension prune), or if the variety is a vigorous one, two buds will grow out and the cut must be made to three eyes. This is, of course, a matter of experience and judgment. In very wet summers there is frequently no visible effect on the second bud and summer pruning is practically then a failure.

The rule for cutting therefore works out thus. At the proper time cut every wood shoot that is not a brindille, no matter what its length is, provided it is at the right stage of woodiness. Cut to the basal cluster if well developed otherwise to two visible eyes or exceptionally to three.

Second generation shoots were produced as the result of the hard cutting in the first two years' experiment. These were always thin and spindly. If cut again a month after the first cut, as Lorette directs, the spur usually died. When the cut to two eyes was substituted, the thin shoot produced did not matter as there was a developing dard behind; and it could be cut away at a later date. When this was done at the July-August prune no effect could be observed on the developing dard below. It was not stimulated as far as the eye could see. The operation, therefore, seemed pointless for Long Ashton conditions, and as a matter of fact it was soon found that July-August prunings were dangerous owing to the liability to canker infection. This liability seems to begin in July and greatly increases in August. For this reason alone prunings in August for the apple should be avoided here.



No third generation shoots were ever produced at Long Ashton. Altogether Lorette seems to have obtained far greater effects from his second July-August pruning than can be got there.

### *3.—Pruning of Wood Shoots on Developing Spurs.*

Here Lorette's direction seems to be undoubtedly correct. If as usually happens there are dards or developing flower buds behind the wood shoot these must not be forced out into growth by too short a prune. At the same time they must be further stimulated. For this reason a sap-drawer with one good eye is left. If more than one sap-drawer were left, or one sap-drawer with two good eyes, there would be a danger of the dards remaining undeveloped.

His method of treating grown out dards is also obviously correct, though sometimes at Long Ashton in wet seasons the treatment results in no buds developing in the basal cluster and a dead spur being produced.

### *4.—The Treatment of Brindilles or Twiggy Shoots.*

Here one comes to what is perhaps the least instructive part of Lorette's teaching. He himself seems rather vague in his opinions and gives various methods of treatment in different parts of his book. At one point he says that they are unsuitable for cutting. At a second he advises cutting to three leaves, presumably eyed ones, at the end of June, and at a third his advice is that they should be bent downwards by a small weight and an oblique incomplete incision should be made with a knife between the third and fourth leaves. This process is supposed to cause the back buds to break. Where possible, as Lorette says, they should be left untouched in the case of vigorous trees in order to fruit, but it is precisely in such cases that they are liable to end the season with a wood bud terminal. Such brindilles will not fruit and only crowd the tree if left. Further, in any case it is difficult at the time of the first prune to estimate whether a brindille will end the season crowned with a flower bud or not. Something therefore has to be done. The most satisfactory operation seems to be to cut to two visible eyes as in the case of most wood shoots without a basal cluster. Owing to their nature usually not more than two buds break, the hinder one becoming a dard. If, on the other hand, they are formed of more than one year's wood and have dards already behind them, the cut to the basal leaf at the end of June, for pears, gives the best result. These dards rarely grow out. Certain varieties of apples, such as Worcester Pearmain, Allington Pippin and Lord

Hindlip, produce a large number of brindilles. In the drier climates of the Midlands and East of England these are best left if not more than six inches in length at the pruning time. They usually bear fruit the following year, and the bending down due to the weight of the fruit usually causes one or two buds behind to develop into dards. They can then be shortened. In the wet Long Ashton climate, however, this by no means always happens and for this reason only short brindilles should be left untouched. In all climates if brindilles are more than six inches at the time of pruning they are best treated, especially if obviously still growing in length, as the chances are that such shoots will not possess a flower terminal bud at the end of the season.

These brindilles are produced in several ways. Usually they are the result of a late start of comparatively strong wood buds. Thus a weak dard may start in early summer instead of spring, either through too hard pruning or through a sudden spell of wet weather, especially if this succeeds a period of drought. They are also produced in a modified shorter form from the bourse eyes in tip-bearing varieties like Worcester Pearmain, Allington Pippin and Lord Hindlip. These eyes start late in the season, about June, (they are not formed of course till after the flower has fallen), but stop growth comparatively early, bearing again flowers at their ends.

#### 5.—*Treatment of Bourses.*

The treatment of wood shoots from bourses is also probably correct, but the practice is not always easy. Thus, when fruit is there it is often difficult to see if dards are present, at least reasonably quickly. If a developing flower bud occurs behind on the bourse a cut to the basal leaves of the wood shoot may force it out, though generally if fruit is forming this will not happen. When no fruit has set it is easier, though not easy, to see what one is doing; and in that case, unless one is sure, perhaps a cut to two eyes is safer. On the other hand, when fruit is present and it is desired to cut a wood shoot of a bourse closely, it is sometimes impossible to do it owing to the bulge of the fruit. In that case one prunes as closely as possible.

#### 6.—*September Clearing.*

According to Lorette all stubs of treated shoots are completely removed at the Aug.-Sept. prune, leaving only flower buds, dards and brindilles beside, of course, wood shoots which are extension growths of already formed leaders.

At Long Ashton no effect could be seen to follow from this operation and there appears to be no reason why this should not be done in winter if more convenient.

### *Conclusions.*

Summarised therefore one may make the following criticism on Lorette's directions for the Long Ashton conditions.

- (a) Pruning hard to obtain stipulary eyes for flower formation is very unsatisfactory.
- (b) Pruning to the basal cluster where present is far better, but results in occasional failures.
- (c) Where no basal cluster exists a prune to two visible eyes, not three, should be made.
- (d) The time of year, the state of lignification at the base and the presence or absence of basal cluster should be used for criteria rather than the length or thickness of the shoot.
- (e) Brindilles should be cut to two eyes where they cannot be safely left, not to three. The bending down method is hopeless except for a garden.
- (f) Shoots from bourses should be cut as close as possible, if carrying fruit; if not, treatment should be according to whether large dards are present or not.

### SECTION III.—THE SYSTEM IN RELATION TO LOEB'S HYPOTHESIS OF GROWTH INHIBITION.

It must be at once admitted that Lorette's system is a brilliant piece of empiricism. Like all empiricisms it does not pretend to explain, and like all empiricisms it only works under conditions similar to the original ones. Nevertheless his methods are of the greatest interest and may prove most valuable in the long run to commercial growers.

His main ideas as regards flower production appear to be two. One is pruning only when "the sap is in motion." This idea is not, of course, out of the ordinary as regards spur pruning, but it would appear to be so when applied to the leaders. And yet, perhaps, it is not so novel as appears at first sight, since no effect of pruning is ever produced unless and until vegetative growth follows. Thus a winter or dormant season prune does not have its effect until growth begins in spring, and a summer prune has no effect if the

tree is stunted or its growth completely pulled up by drought. The sole difference, therefore, between those and Lorette's April-May extension growth prune is that the effect of the latter takes place a week or two later than that of a winter prune. In practice there is no difference in the effect produced. Indeed this pruning must be put off till towards the end of May to produce an effect on the basal buds.

Thus, if one prunes an extension shoot at this time and the cut be made behind those apical buds which are still actively growing to a bud that has settled down nearly or completely to the dard condition, it may be shown by direct measurement that the basal buds are stimulated. The growth in length thus produced is not large but it is distinct. After the new terminal begins to grow out further measurable stimulation of the basal buds ceases.

Again, a similar basal stimulation may be obtained by cutting an extension shoot in April to bare wood. Certain varieties at Long Ashton, like Beauty of Bath, produce a considerable amount of bare wood, especially in young specimens. If the prune be made behind all growing buds to a dormant one, this one and several more behind will be forced out. Like the first case, however, the duration of growth of these basal buds is short and is limited to the time during which the new terminal bud is growing slowly. As soon as it attains rapid growth in length further growth in length of the basal bud ceases.

The difference in result between Lorette's April-May extension prune and the two cases just cited can be easily explained by Loeb's hypothesis of growth inhibition and, so far as the authors are aware, by no other. This hypothesis postulates that the foliage of a growing plant produces some substance which, being conveyed backwards through the stem, has a toxic and inhibiting effect on buds situated more basally. That is to say, a substance is produced which travels probably chiefly, if not entirely, through the phloem tissues and tends to prevent buds situated more basally from growing out. This hypothetical substance has not yet been isolated and may indeed be incapable of isolation, but the assumption of its existence explains so many facts, and fits in so remarkably well with many hitherto unexplained phenomena of plant activity, that one is justified in using the hypothesis until disproved. Applying it, therefore, as a working hypothesis to the three cases cited, the following conclusions are arrived at.

Lorette's April-May prune is to an active bud which is elaborating toxin and therefore there is a check to the further development of any basal buds. A prune to a closed bud at the end of May, or to

bare wood in April, is to an inactive bud and therefore for the time no toxin, or a nominal quantity only, is being passed backwards. Thus the basal buds or the dormant buds have a chance of development until they are inhibited by toxin produced by the growth of new leaders or of buds more apical to them.

Lorette's second main idea appears to be the use of dormant basal eyes for development of flowers. This practice has one great advantage in that the flowers and fruit are carried close to the main supporting stems. It also has a second advantage, this being that these truncated clusters take a long time to develop fresh active growing points. During that time it would appear to follow that there may be more available food for buds developing in the right direction and certainly less toxin in the bottom portion of the tree. Whether this reasoning is correct or not, it is an undoubted fact that the basal cluster cutting tends to keep the lower portions of the tree better furnished and increases the size of the fruit.

He maintains that both stipulary and basal cluster eyes are more suitable for production of flower buds than eyes higher up a wood shoot. Of that he does not give any evidence, nor does there appear to be any. Nevertheless the other advantages accruing are quite enough to justify his practice. To one accustomed to the usual method of summer pruning in August, where the cut is made to four or five eyes for the future spurs, Lorette's system seems both too early and too hard. The August prune, however, is generally useless for flower production. If the cut is made to five buds, only two buds at the most are apparently influenced by the end of the growing season. The apical bud of the pruned shoot may make an outgrowth and the second bud may be plumped up. Nothing further visibly happens, and both these "influenced" buds are removed by the winter prune, so that the result of the summer pruning is nil. The Lorette way is quite different. The summer prune is much earlier, but its earliness is balanced by the weakness of the buds to which the prune is made. The buds that have been "influenced" are not removed by winter pruning and the flower buds are obtained close to the supporting branches.

One may apply Loeb's hypothesis still further, and show why Lorette's methods are usually satisfactory, and why they partially fail at Long Ashton. Before doing this, however, in detail it is necessary to consider the hypothesis still further in its bearing on tree growth.

According to the definition of the hypothesis the inhibiting action depends on the amount of active growth that is being

made. If this is so, the general growth activity of the tree should serve as a measure of its amount, and its activity may be estimated by the growth in length of the leaders. Weekly measurements of leader growth were made during one season at Long Ashton for three varieties of pears and five varieties of apples. For each variety two leaders were measured on each of five trees every week during the growing season. Each variety thus had ten measured shoots distributed over five specimens. Averaging up the measurements for all the pears, it was found that there was a sharp rise of weekly leader growth to a maximum, which was reached on the 22nd of May. This figure was maintained almost at the same level till June 6th, after which there was a moderate descent to June 26th, and a further much more gradual descent to zero by July 31st. For the apples the rise to the maximum was slightly less steep and its attainment was three weeks later, namely, on June 12th. From here there was a moderate descent in intensity to June 26th, after which it remained practically the same to July 17th, and then fell gradually to zero on August 14th. Admittedly these results only refer to one year, but there is no reason to suppose that they would be seriously different in other years. Indeed less complete measurements of a previous year, which those just quoted were designed to supplement, all tended in the same direction. The results show that leader activity and, therefore, presumably Loeb effect for pears is three weeks in advance of that for apples. They further show that the intensity attains a maximum in the early part of the season, ranging about the end of May for pears and the middle of June for apples. After the maximum in both pears and apples there is a moderate decline for about two weeks and a further gradual decline for about six weeks.

It is now possible to look at Lorette's methods from the point of view of the Loeb hypothesis. It is, of course, realized that the growth-inhabiting substance may be, and probably is, only one of the acting factors. There may be, and probably are, other factors, prominent amongst which is no doubt the distribution of available food supplies.

The simplest case in the Lorette treatment for production of flower buds is that of the wood shoots of one year's growth only. From their nature these can only be found arising from the supporting branches of last year's growth. They are, therefore, always to be found towards the top of the tree and they consist of those shoots not destined to act as extension shoots of supporting branches already in being. Lorette directs that those with good basal clusters shall be cut to the dormant eyes of these clusters when the

shoot has attained the right degree of lignification at the base and the right length and thickness. These conditions are found round about the end of June, and the third week in July, for pears and apples respectively. At these times, as already shown, the general Loeb effect has passed its maximum and is decreasing in intensity. The basal dormant buds are, however, subjected to the Loeb effect from two directions. Firstly and mainly, they are influenced by toxins descending from the apical bud of their own shoot and, secondly, by those descending from the rest of the tree above them. After the prune to the basal cluster the main supply of toxin is cut off, but they are still presumably under the influence of the second supply. This, therefore, will determine the amount of the Loeb effect. As has been shown, however, in the second article of this series,\* there is a second factor, the bud factor, that comes into play to determine whether any given bud will or will not grow out. It is uncertain exactly what this factor means, but there is an indication that it has to do with vascular supply, though the availability of food must not be ruled out. It seems to be determined largely by the previous history of the shoot. Thus a shoot commencing to grow out in the height of the growing season possesses extremely weak buds at the base. A quick apical growth means a large Loeb effect, and this would thus explain why these basal buds are especially weak. The position therefore is this. After the basal cut has been made the development of the dormant basal buds will depend (a) on the intensity of the general Loeb effect descending the tree and (b) on the strength of the dormant basal buds. These, though dormant and invisible to the naked eye, nevertheless actually exist and may be spoken of as either stronger or weaker. It may be supposed therefore that in the drier conditions, like those of the Midlands and East of England, the dormant buds will be relatively strong, while in the wetter, as at Long Ashton and the South West of England, they will be relatively weak. In both cases the toxins descending the tree should be less than for shoots situated lower down in the tree, since there is less producing tissue above them, though even here in the wetter climates it would be greater than in the drier. The inhibiting factor for these basal buds is thus relatively small and there is in consequence a tendency for them to grow out into wood shoots. These shoots are the secondary ones of Lorette and become apparently thick enough for him to apply the same process again

\* Factors Governing Fruit-bud Formation." II. "The Normal Annual Growth of the Apple and Pear."—*Annual Report Long Ashton Research Station*. 1919.

in a month's time. At Long Ashton, owing to the quicker growth and bigger Loeb effect produced, the shoots are thin and spindly and altogether unfit for a second treatment.

Shoots that are not of pencil thickness, but are otherwise suitable for cutting, Lorette cuts to three eyes. Such shoots, as indicated by their lack of thickness, are generally of quick growth, having been subjected to a big local Loeb effect, with the consequence of especially weak dormant basal eyes. For this reason they cannot be cut to the basal leaves and Lorette's exceptional cases become the general case for the wetter climates like Long Ashton. Even here, however, a further modification has to be made owing to the high local Loeb effect, and the cut has to be made to two eyes (usually) and not three, since the effect of the prune only extends back (usually) to two eyes and not to three.

For wood shoots arising from wood treated last year, *i.e.*, from what are really incipient spurs, Lorette advises cutting to the basal cluster if no dards are found behind it or to one eye if developing dards are present. If more than one wood shoot is present, all are removed except the weaker, which is cut to one eye. These practices are again clearly explained by the Loeb effect. Where no dard is present, but only a wood bud, a considerable stimulation is needed for transforming it into a dard. By cutting to the basal cluster the local Loeb effect is thereby removed. The practice is correct for dry or wet climates, since it is the maximum cut that is possible and it does not matter if the basal cluster fails to develop eyes, there being a well formed wood bud behind which can be influenced. Where dards are present behind, less stimulation is required and so one eye is left in front. This is a weak one and takes some time to grow out, though not so long as the basal eyes; but during this time sufficient stimulation is given to transform the dards into flower buds. If the prune were made to the basal cluster, dards would be caused to grow out owing to the removal of the Loeb effect for too long a time.

The brindilles are undoubtedly the most difficult of all the growths recognized by Lorette to treat successfully. They are, perhaps, best regarded as merely a specialised form of wood shoot. They are generally formed from weak buds that have made an extra quick growth owing to a late start bringing them into the height of the growing season. They have on that account the usual ill-developed basal buds and therefore as shown above cannot be cut here. Regarded thus, they simply fall into the class of shoots that have been under a specially high Loeb effect, somewhat similar to, though more extreme than, the ordinary wood shoots formed in wet climates.



Their treatment therefore is the same : namely, a cut to two visible eyes. Lorette's bending and incision treatment, though obviously impossible on a commercial scale, is interesting, as both processes cut off part of, but not all, the local Loeb effect. If all is cut off, as in pruning to two eyes, though there is a time when no Loeb effect is descending on the basal buds, this time is short owing to the pruned eye growing out and thus remaking a considerable quantity. If bending and incision are practised the Loeb effect is lessened, but the lessening lasts longer than the complete removal ; so no bud grows out and many are plumped up. One gets therefore several buds going into dard form instead of one.

The bourse may be looked upon as a wood shoot which may or may not be bearing a fruit. It also frequently has developing dards on it. If it has, Lorette says "cut to two eyes." The fact that he advises two and not one, as in the case of a wood shoot from a spur, may easily be due to the fact that shoots from a bourse, being necessarily late growths, are especially poorly formed at the base. Therefore one eye would not give enough Loeb effect to keep dards from growing out, especially if no fruit be forming. Where no dards are present, the bourse shoots may be cut to the base just as in the case of incipient spurs.

In September Lorette cuts away all stubs or previous prunings. At Long Ashton no definite result of September pruning has ever been seen. Whether or not there is any advantage in the September prune over a similar prune in winter is doubtful. At this time the tree has ceased growing and, except that it has not dropped its leaves, has practically attained the winter condition.

The Loeb hypothesis thus serves to explain Lorette's results and also his failures when applied to wetter climates. The system may indeed become a complete failure in extra wet summers at Long Ashton. In these cases the Loeb effect is so high that only one bud is influenced as the result of a prune, viz., the apical one left, which grows out into spindly wood. The second and remaining buds are unaffected and the result of the pruning is nil. The hypothesis also indicates the direction of control. It is clear that the Loeb effect must be weakened if possible. This may be done by root pruning, which is an extremely clumsy method, by using a more dwarfing stock which may have mechanical disadvantages, or, perhaps more easily than any other method, by main trunk or main branch ringing. This subject is treated from the practical point of view in the last section and the reader is referred to it for details.

It has been shown that Lorette's first summer pruning is fully justified, both on theoretical and practical grounds, if certain

necessary variations are made when occasion required. His subsequent prunings, however, are of more doubtful merit. Certainly there is a strong tendency for them to be less effective. The position is further complicated by the fact that, for apples, after the first July pruning there is rather a strong probability of canker infection. For these reasons it has been found to be a better practice at Long Ashton to omit any second or third summer prune and to apply a second one in winter. A further strong argument for this accrues when the whole practice of pruning is considered from a commercial point of view. It may be safely taken as self evident that no grower would be able to afford the time to do more than one summer prune. Many will no doubt deny that they have time even for this. Whether it will pay or not to put extra labour on for a single summer pruning will, however, depend on the results that can be obtained. A few growers have already begun to put some of Lorette's methods into practice, so that they at any rate regard the experiment as worth making. There, indeed, seems very little doubt from the results already obtained at Long Ashton that, if his methods can be rendered reasonably simple and within the understanding of ordinary labour, they should be a source of considerable profit to growers.

#### SECTION IV. A SUGGESTED SCHEME FOR COMMERCIAL PRACTICE.

Lorette's complete system does not appear to be applicable to commercial practice owing to as many as four prunings being necessary, one extension prune in spring and three subsequent prunings in summer and autumn. Only one summer pruning could probably be done commercially, but a satisfactory scheme for flower production can be formed if solutions can be found to the following points.

- (1) Only one operation to be performed in summer, but a second one admissible in winter, when there is far more time.
- (2) Some means of forcing the breaking of dormant buds by other means than pruning.
- (3) Directions for summer work to be so simplified that ordinary labour will be capable of carrying them out after a little practice. (When the owner or foreman does the work the directions may be more complicated.)
- (4) Some means of controlling excessive Loeb effect when circumstances nullify pruning results.

*(1) and (2). The Winter Prune and Knife-Edge Ringing.*

From what has been already said in previous sections it is clear that the prune coming about July 21st for apples is the one that has the greatest effect. This therefore is the time when summer pruning should be done. After that the trees need not be touched till the dormant winter season.

At this period pruning has two objects.

Firstly, the tree must make further extension growths, if not already of full size. This is largely a question of training and cannot be discussed here. There are, however, one or two points that can be touched on. The leader is cut generally at such a point as will, in the opinion of the pruner, cause a satisfactory break of basal buds. This, however, is not necessary if, as in point 2, some other method is known for forcing dormant buds. Suitable ringing will have this effect. The method then becomes as follows. Cut the leader in winter to any eye desired. When the spring comes and the buds begin to show green it is possible to see how many basal buds are going to remain dormant on the pruned leader. When this is seen, make a knife-edge ring just below the last bud that shows green. A knife-edge ring is a ring made with the edge of a knife without removing any tissue. The knife, which should be a small one for convenience, is held by the handle between the last members of the thumb and fingers, the thumb being on one side and the fingers on the other. The shoot is held in the left hand just below the place to be treated. The blade of the knife is then brought round the far side of the shoot and is made to approach as nearly as possible to the body of the operator, the wrist being bent inwards as far as possible. Then the cut is started with moderate pressure and the knife-edge drawn round the wood, till by the reverse movement of the wrist and with a finger and thumb grip, it meets the cut already begun. In this way a complete knife-edge ring can be made in one movement and in one second.

One knife-edge ring put in at this season of the year will generally cause from three to eight buds to break. Most of these breaks will go into dards naturally. If the blank space be too long a second or third ring must be made. In most cases one ring is sufficient. No explicit directions can be given as to the number needed, as it will depend on the variety treated and other conditions. As a general guide, however, it may be stated that the greater tendency a variety has to form bare wood, the less effect a single ring will have and the more rings must be made. In no case, when operation on small branches, should a ring be made in which tissue is removed.

The second object of winter pruning is to change otherwise useless wood buds into flower buds. It must be remembered that the effect of the prune will be confined to early spring, when the Loeb effect is small. For this reason usually three buds are influenced behind the pruning cut. This is no doubt the reason behind the well-known continental three-bud spurring system, and so it may be recommended as a general practice. All shoots that are not leaders, or do not already bear flower buds or dards are treated in this way, roughly, that is to say, all wood shoots that require shortening. The method is to count three good buds from the base and cut above the third. A good bud is one, which in the opinion of the pruner, will develop. This is a matter of experience and may result in leaving anything from two to five inches of wood. If the wood growth consists of more than one year's growth from the supporting branch, the count is made from the older wood upwards. If there are dards here, each counts as one. If this process were not adopted and a prune to three eyes on the single year wood were made, the dards would be starved.

There are certain exceptions to be made in this method. Firstly, if a flower bud is present on the older wood the cut is made just above it, whatever its position, thus shortening the spur. If several are present the continental method advises that only one should be left. This is probably erroneous, since two or three may be left with advantage. Lorette leaves far more, but it must be remembered that he restricts his total bearing surface far more than most growers do. For those who wish to exercise greater skill an exception to the exception may be made. Thus, where there is one flower bud behind the wood shoot, but this wood shoot is in a strong position just behind a previous winter's prune, the cut should not be made to the flower bud, but to one wood bud in front. The object of this is to prevent the two flower buds on the future bourse from growing out.

In certain varieties of apples, like Worcester Pearmain, which are tip bearers, there is a large proportion of brindilles. If crowned with a flower bud these should be left where they do not crowd the bush too much. This rule applies more especially to young specimens. If too long, or on already spurred bushes, they may be pruned to three eyes as usual. Older spurs bearing several dards and flower buds should be depleted of all wood shoots and may, if too long, be even shortened themselves.

The directions for winter pruning can now be summarised thus :—

- (a) Cut leaders to bud desired and put in knife-edge rings below last bud to develop in spring.

- (b) Spur wood growths to three good buds.
  - (c) Leave brindilles where possible to fruit, if not cut to three buds.
  - (d) Where possible on a compound wood shoot cut right back to a flower bud if present. (With exception as in text). Where more than one flower bud is present on a spur two or three may safely be left, but not generally more.
  - (d) Remove all wood shoots completely from the older spurs which are already bearing dards and flower buds. Where the spurs are long shorten them somewhat.
- (3) *The Summer Prune.*

For growers and foremen who are capable of understanding Lorette's directions the most satisfactory course is to follow them. His directions, as set out in the first section, are suitable almost certainly for the drier parts of England, including the Midlands and the East. Growers in the South-West should follow the variations mentioned in the survey of Lorette's methods. The chief differences between the two regions will be the poorer development of basal clusters in the wet and the advisability of cutting to two visible eyes instead of three.

Tabulating the concise directions of the Lorette summer prune (about June 30th, for Pears and about July 21st for apples), and the variations for the wetter climate, the following is obtained :—

TREATMENT OF.	DRIER CLIMATE.	WETTER CLIMATE.
"BOURGEON" or Wood Shoot.		
(a) If basal cluster present.	Cut to basal cluster.	Cut to basal cluster.
(b) If basal cluster absent.	Cut to three visible eyes.	Cut to two visible eyes.
"LAMBOURDE" or Spur.		
(c) No dards present at base.	Wood shoots cut to basal cluster.	Wood shoots cut to basal cluster.
(d) Dards present at base.	One wood shoot left, which is cut to one visible eye.	One wood shoot left, which is cut to one visible eye.
(e) Grown out dard.	Cut to basal cluster.	Cut to basal cluster, if strong. If weak, to two eyes.
(f) "Brindille" or Twiggy shoot.	Cut to three eyes or leave to flower.	Cut to two eyes or leave to flower.
SHOOTS FROM "BOURSE OR KNOB."		
(g) If no dards present.	Cut to basal leaf.	Cut to basal leaf.
(h) If dards present.	Cut to two visible eyes.	Cut to one visible eye.

This table should suffice for growers who can do the pruning themselves or entrust it to their foremen. Where, however, operations are on too large a scale for this and ordinary labour has to be employed, some simplification would appear to be necessary. The results will, of course, not be so good.

The simplest modification would be to have all varieties of wood shoots cut back to about half an inch. This would suit cases *a*, *c*, *e*, *g*. When dards were present they could in most cases be forced out. The next modification would be to distinguish between shoots with good basal clusters and with bad ones or none at all. This treatment would suit cases *a*, *b*, *c*, *e*, *f*, *g*. The next stage would be the recognition of dards behind a wood shoot and would include the full scheme.

Which scheme should be attempted must be left to the discretion of the grower.

The combined winter and summer pruning (modified Lorette), has been on trial for some years at Long Ashton and has given satisfactory results. The system may therefore confidently be recommended to growers as one of great possibilities.

(4)

Cases frequently occur in practice where for some reason the pruning methods above described are more or less ineffective. These cases are always produced when growth activity and, therefore, the Loeb effect is excessive. When this is so, a prune only influences the bud pruned to and not any buds behind it, so that the result of a cut is simply a new wood shoot and there is no tendency to transform wood buds behind into dards.

The commonest instance is afforded by a wrong root-stock. Thus, with the exception of specially precocious varieties, a free stock is always unsatisfactory for bush form. There is a great tendency to form spindly shoots and there is the greatest reluctance for buds to form flowers. This tendency is still further accentuated if the scion is a strong one, like Newton Wonder or Bramley's Seedling.

Heavy manuring in certain circumstances may also produce the same results, though these conditions are generally only found in gardens.

Young stages of strong growing varieties, like Newton, Bramley and Beauty of Bath, even when on a Paradise stock, also show the same tendency. In this case, however, the stage is generally a temporacy one and, as the tree gets older, it gradually disappears. Nevertheless it is sometimes desirable to shorten this period by artificial means. This can be done by ringing the main trunk or main branches.

In extreme cases, such as old bushes of strong growing varieties of free stocks, a ring of half an inch may be completely removed from the main stem in spring, or a ring of one quarter of an inch from the base of the main branches. These sizes should in no case be exceeded at the first time of application. The operation should be preceded or accompanied by a thinning out of the leaders where necessary, but these should not be cut back. This practice is far preferable to root pruning and has a very similar effect. Such rings will normally heal over by the end of the season. As a precaution against infection by wound-parasites an antiseptic dressing should be applied to the cut surfaces.

Where a tree is suffering from over-manuring—and this in commercial plantations will be very rare—a main-stem ring of one-quarter of an inch, or branch ringings of one-eighth, should be tried. Branch ringings afford the means of weakening any particular branch.

In the third case, where it is desired to accelerate the flowering of such reluctant flowerers as Bramley or Blenheim Orange, ringing may also be employed, but considerable care must be exercised. It is, of course, easy to overdo the process and stunt the tree, but with care a satisfactory result may be obtained. If the bush is not more than five years old and shows no sign of flowering, the main stem should be ringed about one-eighth of an inch broad. If this heals over very quickly and flower buds still fail to form in sufficient numbers when pruned as above, the process should be repeated the following spring. As a rule, however, the check to the tree will be sufficient to bring it under pruning control.

In older bushes of ten years or more the size of the main stem ring may be increased to one-quarter of an inch, or one-eighth inch rings may be put on branches, if preferred.

By means of ringing, therefore, refractory cases may be easily handled, and there is no reason to doubt that with the pruning methods described, combined with stem ringing where necessary, any apple or pear may be brought into flower, always provided that the other needs of the tree, such as manuring, cultivation and light are properly attended to.

#### *ROOT DEVELOPMENT IN NEWLY PLANTED TREES.*

*(B. T. P. Barker.)*

The results described in this article are the earliest arising from a series of investigations which have been begun with the object of elucidating the part played by the root-system of a fruit tree in determining its course of growth, general health, fertility and

quality of fruit. The studies on the morphological nature of free and Paradise apple rootstocks, which have been in progress since 9113 at Long Ashton and East Malling, and those at the latter Station on pear quince and plum stocks may be regarded as supplying essential preliminary data required before the main problems of root action can be satisfactorily tackled. The way has thus been cleared for a start on some of the lines of attack. As opportunity arises the investigations will be extended to other phases of the subject.

One of the first points to be ascertained is the natural course of development of the root-system of a tree. Fruit trees as ordinarily grown, not being plants raised from seed and left standing undisturbed in the ground on the spot where the seed germinated and the seedling developed, have sooner or later to be transplanted from nursery quarters to their permanent positions in field or garden. The behaviour of the root-system following transplantation is, therefore, a critical factor in the life-history of the tree, and it may well be imagined that the future fate of the latter is practically determined by the manner and rate of recovery of the root-system after the shift. For this point it is obviously immaterial whether the tree is on its own roots or worked on another rootstock; the shock of transplantation is inevitable in either case and the recovery of the root-system all-important.

The commonest case presented in commercial fruit growing in this country—leaving out of account entirely the case of soft fruits, which will be dealt with on a later occasion—is that of trees budded or grafted on a distinct rootstock. There are instances, such as that of the Pershore plum, where the trees are commonly grown on their own roots; but outside the stone fruit group examples of this are unusual. The case of the apple worked on some form of Paradise stock is doubtless the most familiar of all and, on account of its general interest, it has been selected for the first investigations.

#### PLAN OF EXPERIMENTS.

The programme of the work, briefly stated, has been arranged as follows. A plantation of apple trees, one to three years old from the graft, was established in the late winter of 1920, the trees being grouped in two sets. The one set consists of trees planted as permanent in rows 15 feet apart with individual trees in each row at intervals of 15 feet. The other set is planted in temporary quarters in rows alternating with the preceding, the distance between the temporary and permanent rows being  $7\frac{1}{2}$  feet only. In the temporary



rows the trees are set at intervals of 15 feet as in the case of the others. The temporary trees are to provide material for direct observation of root growth. There are 150 of these in all, 30 to be lifted and examined at the end of the first year's growth, 30 others at the end of the second year and so on, until by the end of five years all will have been removed. By this system it is expected that the different annual stages in the development of the root-system can be followed in detail without occasion to disturb in any way the permanent trees. These, of which there are 150 also, are to serve to indicate the nature of the correlation between the growth of the root and that of the branch system of the tree. Shoot growth in relation to root growth will thus be followed stage by stage.

An investigation of this kind involves uniformity of treatment, both of root and shoot, of individual trees at the time of planting, otherwise the results may not be strictly comparable; and it was when a decision as to the standard form of treatment to adopt was sought that a real difficulty was met. There is in fact no uniform system universally adopted either as regards root or shoot treatment at the time of planting. Some growers prune the roots carefully; others do not. Some prune the leading shoots; others leave them unpruned till the end of the first year's growth. It became evident, therefore, that in order to obtain results to cover the various classes of practice it would be necessary to test the effect of a variety of root and shoot treatments. Before describing those finally decided upon, a brief digression is desirable to make the reasons for the decision clear.

The most complete investigation on the planting of fruit trees which has yet been made in this country, is that by the late Mr. Spencer Pickering at the Woburn Experimental Fruit Farm. Some thousands of fruit trees of all kinds were planted at various places and in various ways under his direction. Although all the results were not of the same general order, the experiments as a whole led him to two decided and definite conclusions, viz., (a) that care of the existing root-system at the time of planting is unnecessary, since the fine fibrous roots apparently die off or at any rate cease to function and have to be replaced by a new set formed from the older parts of the roots, and (b) that the main factor in encouraging the development of a strong new root-system and, thereby, the ultimate growth of the tree is excessively vigorous ramming of the roots in the soil when planting. Of the many results of the Woburn work which have, when first announced, aroused controversy, there were none which called forth such widespread dissent as these. They conflicted entirely with accepted practice and, except in so far as

ramming may be synonymous with firm planting, have been almost universally rejected. Pickering's results, however, never appear to have been satisfactorily explained by his critics, whatever view may be taken as to the validity of his conclusions: and the scientific observer can hardly resist the impression that the position is still obscure because the complete story has not yet been fully revealed.

From this it follows that any series of experiments on root treatment in relation to subsequent growth must be incomplete unless an attempt to clear up these points is included. Hence the ultimate form of the investigations under consideration here. Instead of a single form of root treatment being followed for all the trees at the time of planting, five different methods were used, equal numbers of trees being taken for each. The first group had the roots treated according to the prevalent idea as to best practice, viz., all fibrous roots carefully retained, broken ends of roots of any size properly pruned, all roots spread out evenly in the hole prepared for planting, and care being taken when filling in the soil to avoid unnecessary damage to the roots and to leave the tree firmly fixed in the soil, although not rammed in an extreme way. The second group was treated similarly, except that in planting the roots were rammed according to Pickering's method. The third group was constituted of trees which had all the fine fibrous roots deliberately removed before planting, the coarser main roots and branches being alone retained. Firm planting without excessive ramming was adopted in this case, as in the first and the two following. The fourth group was as the third, but for a certain amount of deliberate root mutilation. The coarser roots were slashed with longitudinal cuts made with a pruning knife and penetrating through the cortical tissues to the vascular cylinder, the object being to test Pickering's hypothesis that points of injury serve as centres of new root formation. In the fifth group all branch roots, large and small, were removed, leaving only the carrot-like central stump some six inches or so long. This corresponded practically to the Stringfellow method which was advocated a few years ago in the United States, but never appears to have established itself very firmly there.

Each of these five groups was in turn sub-divided into two for differential shoot treatment. One half of the trees in each were pruned at the time of planting, and the remaining half left unpruned, the first pruning in their case to be given before the start of the 1921 growing season.

Actually, therefore, the trees in the experiment were divided into

ten sets according to treatment, the details of which may be summarised as follows :—

- Set I.—Root fibres retained : tree unrammed : branches pruned.
- Set II.—Root fibres retained : tree unrammed : branches unpruned.
- Set III.—Root fibres retained : tree rammed : branches pruned.
- Set IV.—Root fibres retained : tree rammed : branches unpruned.
- Set V.—Root fibres removed : tree unrammed : branches pruned.
- Set VI.—Root fibres removed : tree unrammed : branches unpruned.
- Set VII.—Root fibres removed and roots cut : tree unrammed : branches pruned.
- Set VIII.—Root fibres removed and roots cut : tree unrammed : branches unpruned.
- Set IX.—Root reduced to short stump : tree unrammed : branches pruned.
- Set X.—Root reduced to short stump : tree unrammed : branches unpruned.

Concurrently with these trials in the open ground, two somewhat similar trials were conducted with smaller numbers of trees in pots, one group being planted in sand and the other grown in water. The object was partly to facilitate observation of the behaviour of the root-system during the growing season, and partly to ascertain if the nature of the medium in which the roots are grown has any material influence on the general course of new root development. That the character and size of the new roots would differ was, of course, anticipated : but whether a difference of origin and distribution would be shown was unknown.

Both in the sand and water cultures, which were kept in the open air, the roots were treated as in the open ground trials with the exception that the ramming method was perforce omitted. It being necessary to limit numbers no attempt was made to test the effect of shoot pruning and non-pruning. All the trees in the pots were therefore pruned.

During the growing season the trees in sand were fed regularly by watering with a dilute solution of potassium nitrate and potassium phosphate. In the case of the water cultures fresh tap water alone, changed daily, was used in the majority of cases, but a

similar nutrient solution to that used for the sand cultures was also tried for at least one tree under each type of root treatment.

The results of the first season's growth of the root-systems in the three different media—soil, sand, and water—have been compared, and the facts which have been observed are so positive in character that it seems unnecessary to withhold publication until the full course of the investigation has been run.

### RESULTS.

*Root formation in open ground.*—Dealing first with the phenomena shown by the open-ground trees, the extent of new shoot growth shown by the trees under the respective forms of treatment at no time during the growing season indicated to the eye any pronounced and uniform gain in favour of any individual method. At the time of writing the actual growth measurements have not been completed, and whether or not they will reveal any definite relation between amount of shoot growth and nature of root treatment cannot yet be stated. If they follow the lines of Pickering's results, the second season's growth rather than the first is the more likely to show a differential effect. The trees which were lifted at the end of the growing season do, however, present certain features which are so marked that they may be regarded as definitely established, and it is to them on this occasion that attention will be confined.

Twenty-nine of the thirty trees lifted for examination show generally the same type of new root-system being produced and the same method of origin. The odd case is so radically different in character that, in view of experience gained during the rootstock investigations, it may be stated without hesitation that the rootstock in this instance is not a Paradise type, but one of the free types which only produce adventitious roots with difficulty; it is therefore left out of consideration in the following notes. The remainder in all examples have produced new roots freely; although some are stronger than others, it is a difference of degree only and not of kind. Broadly speaking, the tree has made practically no use of the old root-system existing at planting time and has instead set to work to produce an entirely new one.

Relatively few persistent roots in any instance, and in many examples practically none, have been formed from any part of the original root-system except that portion of the main stock or butt which lies in the top three or four inches of soil immediately below the ground line, *i.e.*, from the collar of the tree. In this region what amounts to an entirely new system has been formed. From

all parts of the surface of the old stock within that zone roots have been emitted freely. They present all the degrees of vigour, length and thickness to be expected from structures which in the extreme case cannot be more than nine months old. The largest range from two to three feet in length with the thickness, at the base, of a lead pencil. Their age is varied; some obviously must have appeared very shortly after planting, while the youngest are nothing more than root tips just breaking through the superficial tissues of the old root. Some are practically unbranched: others have already developed a relatively complex branch system. The result is a more or less dense rosette-like mass of new roots springing from the collar of the tree with the residuum of the old root-system below, in many cases apparently dead or dying and so sparsely furnished with new growths that there can be no two opinions as to the portion which has during the season's growth functioned as an active root and is destined to form the future root-system of the tree. In the average case it is clear that, apart from a possible use which the old roots may have had as mere mechanical stays or anchors, they might have been cut off three or four inches below the ground level without the tree suffering appreciably. A more complete justification of Pickering's contention as to the uselessness of the finer roots in newly planted trees it would be difficult to picture.

Since in each of these cases with the Paradise type of root-system new root formation has proceeded on the general lines just described, it follows that the special treatment to which the individual trees were subjected at the time of planting, whether at the root or in the head, has had no material influence on the character of the new root-system as a whole. It has been practically immaterial whether the old roots were left untouched or trimmed down to a bare stump. Whether or not the differential treatment has any influence on the vigour of the new root system produced is a point which is not clearly shown by the limited number of trees which have been lifted. Without very decisive differences in strength following individual kinds of treatment no safe conclusions could be drawn from the small numbers of each class already examined; there are certainly no such differences to be seen uniformly. On the whole the balance of strength is in favour of those trees the roots of which were cut hardest; but this may be due quite as much to a difference in vigour of the individual trees themselves as to the kind of root treatment. The course of the results with the remaining trees over the next four years should settle that point. The same position must be taken with regard to the effects of pruning and non-pruning the shoots at the time of planting. The pruned trees

generally promise to lend themselves better to ultimate tree shaping and formation than the unpruned ; but no pronounced effect one way or the other shows so far in the root-systems, although there is on the whole perhaps an advantage in favour of non-pruning in the trees lifted this season.

The varieties of trees lifted on this occasion were Edward VII. Stirling Castle and Whimble Wonder respectively. The differences as regards new root growth were of the order of strength only. The seat of origin was the same generally as described above. The King Edward VII trees were very weak maidens on the English Broad-leaved Paradise rootstock, and the amount of new growth, both of root and shoot, was relatively small. The Stirling Castle trees were distinctly stronger and made generally, for the variety, fair growth above and below ground. The third sort, a local Devon variety of distinct promise for farm orchard purposes, is a much more vigorous grower than either of the preceding and the trees were much stronger when planted. The new shoot growth, except in cases affected by Aphis attacks, was long and stout, and the new root-systems remarkably well-developed and vigorous, especially in those trees with the roots cut back to stumps at the time of planting.

*Root formation in sand.*—Passing now to the behaviour of the trees grown in pots of sand, a very superficial examination of the roots sufficed to show that an entirely different order of root development had taken place. Taking first the case of the trees which had had their old root-systems pared back to a single stump at the time of planting, an extraordinarily prolific development of new roots had occurred : but instead of the seat of origin being practically limited to the three or four inches of root in the collar region, as in the case of the trees grown in open ground, it extended over the whole root surface from the collar to the cut end of the stump. For its entire length the old root had produced a mass of new fibrous roots, and no special zone could be distinguished as carrying a greater wealth of new fibres than the remainder of the surface. The regions of most prolific formation were perhaps those in the immediate neighbourhood of the numerous cuts, now well callused, where the old roots had been excised, *i.e.*, in the regions of wounds deliberately made when transplanting. The character of the new roots also differed from that of those grown in the open ground. Instead of being more or less stout at the base and tapering gradually to a relatively fibrous tip, with lateral ramifications by no means numerous and of a simple rather than branched habit, the new roots in the sand were little more than fine threads, of great length in proportion to diameter

and branching with the greatest freedom into a tangled mass of a very similar degree of fineness and length.

The trees which had been subjected to less drastic treatment at the root at the time of planting showed the same general features, although possibly to a somewhat less striking degree. There was the same tendency to free new root formation from base to apex of the old root-system with no marked zone of special activity, the same extra freedom around the callused surfaces of old wounds and injuries and the same excessively long, much branched and thread-like type of new root. In other words, the preliminary root treatment in no obvious respect influenced the character of the new root-system.

To discuss properly the differences presented by the new shoot growth of these trees in sand and those in the open ground would involve the consideration of issues outside the immediate scope of this article. It is likely that there will be occasion to take up the subject independently before long; therefore nothing further will be said here beyond recording the existence of differences in the character of both the shoots themselves and the foliage, and the absolute freedom from *Aphis* attack shown by the trees in sand at a time when hardly any other trees at the Station were entirely clean.

There is nothing to record as to differences in amount of shoot growth made by the individual trees of these sand cultures, no relation between the nature of the root treatment and the amount of shoot growth being traceable.

*Root formation in water.*—The behaviour of the trees in water culture remains to be considered. The experiments were originally started with the primary intention of utilising them for direct observation of the course of development of the new root-system following the respective forms of root treatment already described, such observation being impossible in the case of trees grown in soil or sand. Within a few weeks of the commencement, however, it became evident that much more would be shown than the nature and sequence of new root formation. The consideration of the results observed which follows, will be deliberately restricted to the immediate subject of this article; the other aspects of interest must be left for a later separate paper, to which their significance entitles them.

New root formation in the water cultures proceeded on obviously different lines from that in either sand or soil.

The water cultures were started in March, 1920, and for the next month or six weeks practically no new roots appeared. It is known that at that season of the year the appearance of new roots either

in sand or soil follows much more quickly and freely. In water, on the contrary, the root-system remained relatively in a state of stagnation. Within three weeks from the start the first signs of a remarkable sequence of events became apparent. Here and there on the old roots patches of a whitish slimy growth developed and these grew bigger and bigger until, with some of the trees, the whole existing root-system was more or less completely coated in a few weeks. This was particularly the case where the old roots had been pruned back to a single stump. It was least marked in the trees in which all the root fibres had been retained. Its nature and significance need not be further discussed here; but it may in passing be recorded that in each of the twenty-four separate water cultures under observation the fungus present was apparently the same.

The condition of stagnation at the root in most cases slowly disappeared. The tips of a few isolated new roots began gradually to show themselves, forcing their way sometimes through the bark of the older portions of the root-system and springing sometimes as fine fibres from the maller of the old roots, where old fibre had been left. A more noticeable development of root activity occurred in the way of lenticel growth. These structures, visible on dormant roots as very small dot-like patches of loose cellular tissue of the size of a pin's head no less, began to enlarge rapidly into pustular outgrowths which in due course grew into conspicuous excrescences of the size of a pea or larger. During the course of the summer, in the case of trees which remained relatively healthy under the water culture conditions, these pustules continued to increase in size until neighbouring ones fused; the result was an extraordinary-looking series of irregular warty masses distributed over the whole root surface.

It will be convenient in describing the sequence of events to refer indiscriminately both to new root formation and this lenticellular development under the general term of "root activity." Sometimes the one, sometimes the other, and sometimes both occurred concurrently: but whichever happened the behaviour of the fungus was the same.

As soon as any sign of "root activity" appeared at any portion of the surface of the old root-system the fungal growth in that region began to diminish. Within a week or two it disappeared entirely in its immediate vicinity, persisting, however, on other parts of the same root system where "activity" had not yet shown itself. In some trees "root activity" was so well distributed that the fungus disappeared entirely and did not make its reappearance until



towards the end of the growing season, when "root activity" began to diminish. In other cases "root activity" was more partial throughout the season and the inactive areas of the root showed the presence of the fungus during the whole summer. In a third type of case "root activity" never really became properly established, the roots remaining practically as dormant as when first placed in water culture, and then the hold of the fungus was never relaxed over the root surface as a whole, with the disastrous results to the tree to be duly recorded. Ultimately in every case as the end of the growing season approached "root activity" slackened to vanishing point. As that occurred the fungus concurrently re-established its hold and eventually more or less completely overran the whole root surface. At whatever period of the season it happened that it finally secured the upper hand, a new feature in due course followed, viz., the development of growths of green Algae. By mid-autumn all the cultures showed the root-systems overrun with both fungus and Algae, accompanied by complete cessation of "root activity." The light-coloured superficial cells of the lenticellular outgrowths became discoloured to a dingy brownish tint and all new root production stopped.

Considering root development alone, it may be said that no uniformity in behaviour could be observed between individual trees subjected to the same initial root treatment. With some, new root formation started much earlier in the season than with others, the time being also apparently quite independent of the mode of preliminary treatment. The same irregularity held with regard to the number and size of the new roots formed, although in this respect the trees with the root-system reduced to a stump produced as a group appreciably fewer roots than the others. Some in fact produced none, a result which also occurred in a few cases in the other series. Most roots were formed on two trees on which all the original fibre had been retained, these springing generally from the smaller rootlets rather than the main roots and fairly freely from the finest fibres: but other trees of the same group showed no more new roots, and in some cases less, than those which had had all fibre removed. The place of origin of the new roots with all the trees was quite indefinite, being neither mainly restricted to the collar zone, as in the case of the trees in open ground, nor distributed more or less uniformly over the whole root surface as with the sand cultures, but simply dotted irregularly at intervals. It might, perhaps, be claimed that rather more freedom of production was distinguishable on the parts of the root within an inch or so of the surface of the water, but the number of new roots all told was

generally so insignificant that the slight balance in favour of that region might have been accidental. It certainly was not a definitely positive result. New root formation in all the water cultures was immeasurably less than in soil and sand, both as regards number and length. In point of stoutness some were of appreciably greater diameter than the strongest of those in sand, but their length was relatively small. This deficiency in root growth was very clearly reflected in the shoot growth. The new shoots were short and fragile and the leaves dwarfed and more or less unhealthy in appearance. In many cases new shoot production was practically nil, the leaves were brown and scorched before the end of June and defoliation well advanced by the beginning of August. The condition of the foliage and the length of new shoot growth formed an almost exact index of the root condition. The greater the manifestation of "root activity" the greener and healthier the leaves and the longer and stouter the new shoots. There is reason to suppose that the better health of the "root active" trees was due at least as much to certain other factors concerned with the aeration of the root-system as to the greater opportunity for intake of food substances: but further observations in this direction will be held over for a paper dealing particularly with that subject.

#### GENERAL CONCLUSIONS.

Having now dealt in a general way with the main features presented by the trees in these three series of experiments, the interpretation of the results and their significance must be discussed. Certain aspects which will more fully be opened up after the experiments have been in progress for a longer time will not be touched upon here, but definite conclusions on the other points already appear justified.

*Influence of aeration.*— In the first place, to anyone who has examined the trees only one conclusion as to the main determining factor for the nature and seat of origin of the new root-system in newly planted trees on Paradise rootstocks is possible. It is that of aeration. In the open-ground trees in the relatively close soil at Long Ashton new root production has practically been confined to the portions of the original root-system lying within three or four inches of the surface. In the sand cultures, with incomparably better aeration, the whole of the old root surface has been able to emit new roots freely. In the water cultures, with undeniably deficient aeration, new root formation has been precarious and irregular to a degree.

With new root formation shown thus to be readily possible at any part of the surface of the old root-system of a Paradise stock, given suitable conditions of aeration—coupled, it need hardly be said, with a requisite degree of humidity—it follows that the nature of the new root-system of a newly planted tree on stocks of this kind will be determined, both as to position and freedom of rooting, by the quality of the medium as regards aeration in which the tree is planted. It also follows that from this point of view the value to the tree of the root-system existing at the time of planting is variable, being dependent upon the nature of the medium in which planting is done. With a light open sandy soil more or less the whole of the original root-system may take part in the emission of new roots, although further tests are necessary to show what degree of lightness is required for this to happen. With soils of closer texture the range of old roots functioning in this respect to a material degree will be less; and under Long Ashton soil conditions the value of all parts other than the three or four inches of main root immediately below the surface of the soil is apparently almost negligible. In any case under ordinary conditions of planting the existing roots can only be regarded as the sources from which new ones spring; they do not appear to be capable of continuing their own growth direct nor could this be expected, since in lifting a tree for transplantation it must be in the highest degree unlikely that the root tips, which are the regions where direct extension growth takes place, remain uninjured. Only in those exceptional cases where a tree can be lifted with a good ball of soil and carefully replanted at once in the immediate neighbourhood are root tips likely to be able to escape fatal injury and be capable of carrying on extension growth.

*Stock Influence.*—Under growers' conditions, therefore, the existing roots may be considered simply from the point of view of being possible originators of new roots, their utility in this respect being determined primarily by the nature of the medium in which they are planted. Now careful examination of the various points from which new roots have sprung in the cases above described has shown that, while aeration is the main determining factor, individual trees differ appreciably in the measure of their response, some producing practically the whole of the new growth in the "collar" region and others a small to moderate percentage on other parts of the old system. The one exceptional case, already mentioned as being almost certainly a free rootstock of the sparsely rooting type, seems to be so illuminating in this connection that its behaviour should have individual consideration at this point.

It was one of the trees from the roots of which the fine fibres were removed and the ends of the remaining coarser roots pruned at the time of planting. No free new root formation occurred at the "collar," in fact only a single root of any size originated in that region. That one apart, practically the whole of the new roots sprang from the callused areas at the ends of the branching roots which had been pruned at planting time. At those parts whorls of new roots, none very strong, but most more than mere fibres, were formed.

Taking this case in conjunction with the remainder it would appear that the position of new root formation is determined in the first place by the nature or kind of the rootstock itself. With such as do not naturally form new roots freely from the older regions of the root-system aeration alone cannot induce a change of habit and the new roots are accordingly still produced from the youngest portions remaining of the old root-system. With free-rooting sorts, like the typical Paradise forms, the factors of age and aeration both come into play and work in opposite directions, aeration generally getting the upper hand. Possibly the anatomical structure of the root will be found to come into the question, but further consideration of that side must be deferred until the histological features of the respective root-types have been more thoroughly investigated. Such contending factors, however, can explain why individual trees on the same kind of rootstock differ somewhat as regards new root formation: and it is noteworthy that as a general rule abundant root development in the "collar" zone is generally accompanied by little new growth on other parts, while somewhat less vigorous growth at that point is associated with more growth on the younger parts of the roots.

Up to this point, to avoid confusion in description, the portion of the tree actually situated in the soil has been referred to as the root-system. Strictly speaking from the botanical point of view, some degree of inaccuracy is thereby involved. Had the rootstocks concerned been all seedling stocks, the term would have been approximately correct; but, being with one exception Paradise types, the below-ground structures are not entirely true roots. The methods of propagation of Paradise stocks account for this. Such stocks, being propagated vegetatively by layering methods, possess a root-system which is entirely adventitious, *i.e.*, which is derived not from the original root of the parent tree of the type, but from true shoots which have thrown out roots themselves. The rooted stock as planted, therefore, is dual in character as regards its below-ground structures. The central axis, from which the primary

roots are emitted, and which to the non-botanical mind appears as a main or tap root, is strictly a stem and the roots proper are the root-like outgrowths which arise from it. Its true shoot character is shown at times by the suckers which it throws up. It follows from this that the free root-formation in the "collar" region, described above, is arising for the most part from a stem instead of, as appears at first sight, the oldest portion of the root: and this fact brings to notice a third important factor—in addition to those of aeration and age of root already considered—in determining the point of origin of the new root-system.

Plants vary widely in their ability to produce roots from stem structures, the behaviour of cuttings providing a familiar illustration. Individual kinds of apples exhibit variations in the adventitious-rooting habit to a very marked extent. Paradise stocks rooting freely and free or seedling stocks in general with more or less difficulty. In the light of these facts the tendency of newly-planted apple trees to throw out the major portion of the new root-system from the "collar" region will be readily understood when a Paradise type of rootstock is used. Since the same considerations arise in connection with the use of other kinds of fruit stocks which are vegetatively propagated, it may be expected that further investigation will show that trees on quince rootstocks for the pear and the Pershore and numerous other types for the plum behave similarly. On the other hand, when trees are worked on free or seedling stocks their behaviour in the production of new roots is likely to be far less uniform. In such cases it is very difficult to decide with precision by external examination where the stem portion of the stock ends and the root proper begins; but it is probable that in planting the tree not only the root but the basal portion of the stem of the stock is covered with soil. If that is so, the result will almost certainly be affected by the facility of the individual rootstock concerned in producing adventitious roots. One may expect to find, therefore, some trees following more or less closely on the lines already described for Paradise types and others producing new roots in quantity only from the younger portions of the initial root system, aeration in their case being still a determining factor as regards extent of new growth.

This point was particularly well illustrated in one of the trees examined where an old injury at the "collar" had resulted in the cortical tissues being destroyed, and the vascular cylinder exposed for nearly one-half of the circumference in that region. No root formation on that side of the "collar" was accordingly possible. The collar rosette of new roots was thus one-sided and in sum total

much less than it would have been, had the injury not occurred ; a considerable part of the energy for new root production was diverted to the lower-placed parts of the old root system, which formed much more new growth than usual as a result. Appearances suggest that the individual tree is capable of a certain effort at new root production after transplantation, and that if circumstances prevent new roots being formed in positions where external conditions are most favourable for vigorous growth it seeks the next best outlet for its effort.

From what has already been observed it is clear that the old root-system, even though it may remain unproductive of new roots, does not necessarily die quickly. Sooner or later death follows at the extremities of branches which remain "dead ends" and produce no new growth, but the results observed show that vitality may persist even after a whole season's inactivity.

*Points of practical significance.*—It is obvious, in view of the results described, that they have an important practical bearing on the methods to be adopted in the planting of young fruit trees. Some of the questions raised it is not proposed to discuss on this occasion, since it is desirable to allow the main scheme of the experiment to proceed further in order to see how the growth of the tree in future seasons will be correlated with the behaviour of the root ; but there are other points which it is not premature to indicate.

Firstly, the degree of care to be given to existing roots of a tree about to be planted should depend upon the kind of rootstock used and the character of the soil in respect of aeration. It seems a complete waste of effort in the case of freely adventitious-rooting stocks like the Paradise on heavy soil to give the measure of care at the time of planting which is commonly accepted by growers as the standard form of treatment and advised in horticultural text books generally. In these cases, notwithstanding the storm of criticism which Pickering aroused when he advocated disregard of fibrous roots in planting, there can be little doubt that he approached more nearly to sound economic practice than he was given credit for. Had he discriminated in his methods according to the soil and root types to be dealt with, his position would have been unquestionably sounder ; for, since so many of the seedling or free stocks do not produce adventitious roots freely and, therefore, have to rely primarily on the new outgrowths from the existing roots, it follows that in their case the more of the original root-system which can be preserved the greater is the area from which new roots can arise. Even in these instances, however, the finest root fibres seem to be of relatively little practical utility, the new roots which count

being produced from coarser roots. Until further investigation of the behaviour of free stock types has been made, it would be at least injudicious to recommend any drastic change from accepted methods.

Secondly, since aeration obviously plays so important a part in the extent of the development of the new root system, the need of providing the best possible soil ventilation cannot be too strongly emphasised. Efficient drainage, deep preliminary cultivation, the lightening of heavy soils by the incorporation of suitable opening material, and the maintenance of a good tilth by surface cultivation during the growing season, especially that following planting, are methods which come at once to mind. Pickering's results, showing the beneficial effect of ramming the roots as firmly as possible in planting, may seem at first a little difficult to account for, because the ramming of the soil must tend to consolidate it to an extent sufficient to reduce soil ventilation around the original roots; but a possible explanation appears to be that by rendering conditions unfavourable to new root growth in that region the effort of the tree is concentrated on the production of new roots in the "collar" region, which not only get the benefit of good aeration by their nearness to the surface, but also possibly are kept relatively well supplied with water during the drier part of the growing season by the consolidated soil immediately below them. The question of soil moisture obviously has to be considered in connection with soil aeration and a suitable relation between these two factors for growth must be maintained throughout the growing season to obtain the best results in the way of new root growth. The water supply is certainly one of the limiting factors in root development. When deficient, it is undoubtedly a direct cause of checked growth; but when excessive, the evidence at present available is not sufficient to decide whether the harmful effect is direct, or indirect by the impairment of aeration, or a combination of both.

Thirdly, the stability of the newly planted tree in the soil must be ensured. The importance of firm planting is probably universally accepted and it may appear unnecessary to say anything further upon a point which has ranked almost as an axiom; but these investigations have raised one or two questions in this connection which deserve consideration. The importance of avoiding undue consolidation of the soil will be apparent from the remarks in the last paragraph on the need of adequate aeration. At the same time the soil must not be left so loose that its water-lifting and holding capacity is impaired. The degree of consolidation clearly, therefore, should depend upon the nature of the soil. Its physical

condition at the time of planting will have a definite effect on its ultimate state in this respect and the drawbacks of planting when the soil is over-wet will thus be readily appreciated. The more obvious point in firm planting is, however, that of preventing a loose roothold, which entails risk of breaking of new roots when the tree is subjected to wind. Now it is evident from what has already been said above that the case of trees on rootstocks which produce the new root-system from the younger portions of the old is different from that of those on rootstocks which provide the major portion of the root system *de novo* by adventitious root formation. With the former firm planting gives the old roots a good hold on the soil and they rapidly supplement this by the new and finer roots which they proceed to produce mainly from the callused ends of the smaller branches. In this way a firm grip of the soil is quickly secured and the tree soon can become self-supporting. In a word, the old roots play a vital and direct part in the maintenance of the stability of the tree. The other case is of a different order in that the old roots, so far as they have any value, act mainly mechanically and lifelessly. They produce little in the way of new roots and therefore cannot succeed in getting a direct grip on the soil. As they remain more or less inactive their hold must be loosened as time proceeds and the tree itself probably receives very little assistance from them by the time the growing season is well under weigh. This means that the main burden of anchorage is thrown on the newly formed roots given off in the "collar" region and the risk of damage to these must be considerable. Whatever may be done in the case of trees of the former class firm staking for those of the latter seems eminently desirable. Granted the need for staking them, the question then arises as to whether firm planting is not only unnecessary but actually a disadvantage. In so far as it tends to consolidate the soil and thus to render it less well aerated it may be argued that it is a positive disadvantage: but until direct experiment has settled the point its further consideration may be deferred.

Finally, while not attempting at this early stage of the work to suggest any particular form of root preparation or treatment prior to planting as conducing to the best development of the new root-system, attention may be directed to the fact that so far the amount of new root growth does not appear obviously closely correlated with the preliminary treatment of either roots or shoots. Individual trees differ in a way which suggests the influence of an internal factor or factors more potent than the mere form of mechanical treatment, something which is covered by that nebulous expression,



PLATE I.



Fig. 1.

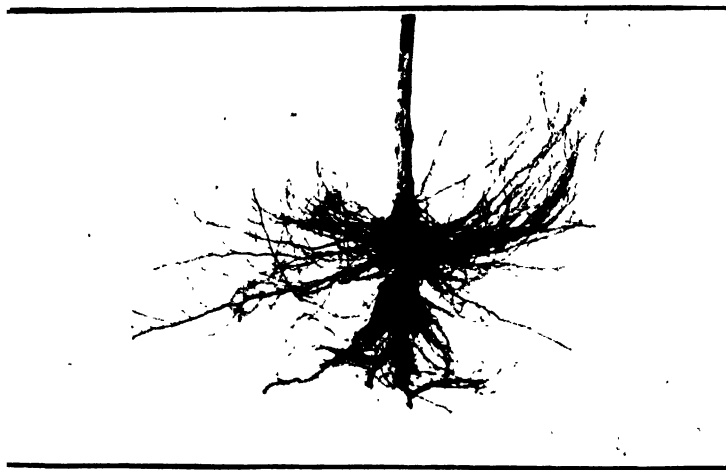


Fig. 2.



PLATE II.

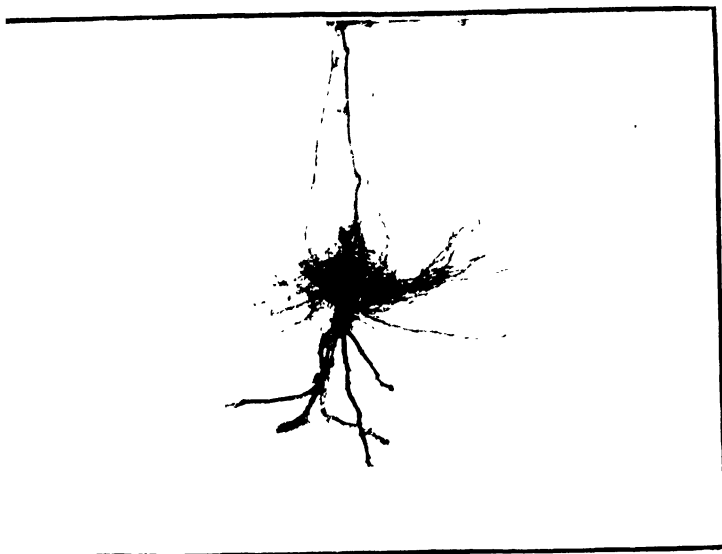


Fig. 1.



Fig. 2.



PLATE III.

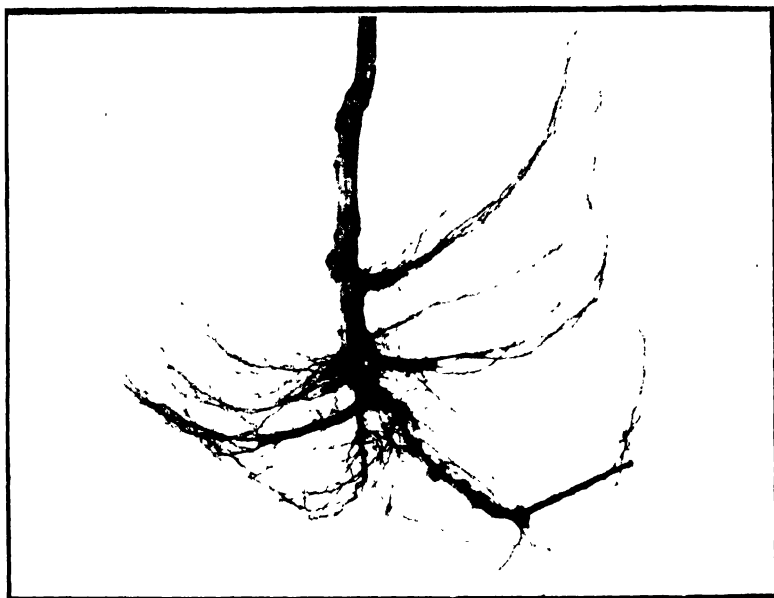


Fig. 1.

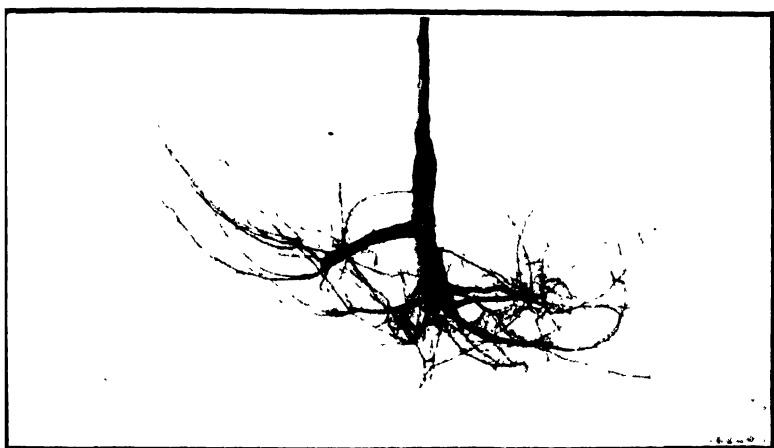


Fig. 2.



the "individuality" of the tree. Further research will possibly show the conditions under which a tree is grown in nursery quarters which are required in order to render it capable of the freest root production after transplantation. It must not be overlooked, however, that it may be the quality of the new root-system rather than quantity alone which is essential for the future welfare of the tree. It has been shown that, taking into account only those trees lifted for root examination after one season's growth from the transplant, the amount of new root growth does not correspond with the amount of new shoot growth. Some which have made very little shoot growth, for instance, have produced a relatively strong new root-system, and others *vice versa*. It does not, of course, follow that, had a second season's growth occurred before examination was made, this result would still have held. The tree with the bigger root-system may get the benefit of this in its second and subsequent years' growth and go ahead of its rival with the small root-system in spite of the better start of the latter in its first season. This would be in accord with the expectation of most growers and receives support from some of Pickering's observations in his experiments with rammed and unrammed trees; for in those he found that it was only in the second season, as a rule that the beneficial effect of ramming began to show in the shoot growth. One may at least conclude that, for the first season after transplanting, the amount of new shoot growth does not necessarily provide a measure of the amount of new root growth and that accordingly, it would be unsound to draw deductions as to the effect of any treatment given to a newly planted tree based on observation of the new shoot growth of the first season only. That being so it is evident that the further significance of the results recorded in this article must be awaited until the experiments have proceeded to a more advanced stage.

#### DESCRIPTION OF PLATES.

PLATE I, Fig. 1.—Root-system of apple tree planted March, 1920, roots unrammed, and fibrous and fine roots not removed at time of planting: showing strong development of new roots in the "collar" region and little new growth from the original root-system below. (Paradise root-stock.)

„ Fig. 2.—As Fig. 1, but roots rammed at time of planting.

PLATE II, Fig. 1.—As Plate I, Fig. 1, but fibrous and fine roots removed at time of planting.

„ Fig. 2.—As Plate I, Fig. 1, but all roots except the main stump removed at time of planting.

PLATE III, Fig. 1.—As Plate II, Fig. 1: this tree being damaged at the “collar” region on one side and the wood exposed shows new root formation in that zone on the uninjured side only. Note the greatly increased root production from the lower parts of the old root-system as a result.

„ Fig. 2.—As Plate II, Fig. 1, but tree on free stock instead of Paradise. Note absence of “collar” rosette of new roots, the formation of the latter being confined almost entirely to the pruned ends of the old roots.

The upward direction of the finer roots is due to the trees being photographed in an inverted position in order to expose to view more clearly the behaviour of the old root-system.

#### *SINGLE VARIETY CIDERS AND PERRIES, 1919-1920.*

*(Otto Grove.)*

In the table below will be found a list of the apples and pears tested during the season for their cider and perry qualities, giving the chemical composition of the juices and other particulars.

Upon the whole the ciders and perries of the 1919 vintage were good, but suffered to a certain extent from lack of body, this being due in part at least to delayed filtration resulting from congestion of work in the cider house throughout the season.

The average specific gravity of the freshly expressed juices was 1.0523, which is a little higher than usual.

As regards keeping quality, after about one year in bottle, there were no cases of cider-sickness, but several cases of ropiness developed during the summer and autumn. One of these was a very exceptional one, which appeared in a cider made from a mixture of about equal parts of Cap of Liberty and Kingston Black apples. The cider was bottled during the early summer and after a couple of months the whole stock turned ropy rather suddenly. The blend had an acidity of .86% of malic acid when bottled. This high acidity would under normal conditions eliminate any danger of



ropiness. On examination of the ropy cider it was found that the acidity had fallen to .4% of acid. It is probable that in this case two sets of micro-organisms have been active, first, an acid-destroying organism, which by reducing the acidity below the safety margin gave the second, the ropiness bacterium, a chance of development. This complex type of disorder is being investigated more closely.

In the case of this particular cider, as soon as the ropiness had been observed, the cider was pasteurised by placing the bottles in a waterbath and slowly heating until a temperature of 140°F. had been reached. The bottles were kept at that temperature for 15 minutes. This treatment not only stopped further development of the disorder, but resulted in the slimy consistency disappearing in a short time. The cider ultimately became quite good in flavour but was disfigured by a slight stringy deposit.

#### *Sharp Varieties.*

No. 1 Jelly (new) was a very sharp cider with a clean dry flavour. Nos. 2 and 3 were not quite as good as usual for the variety, both rather thin; the same was the case with the two first Cap of Libertys (Nos. 5 and 6). No. 7 was decidedly better. No. 8 was very good with a pronounced aroma. No. 9 (new) was rather coarse in flavour. No. 10 had a fairly soft pleasant flavour and a good aroma. No. 11 (new) was without much character. Of the two Foxwhelps, No. 13 was decidedly superior. Tom Putt (No. 14) was fairly good, but went ropy; this is another case of a cider in the sharp group being attacked by this disorder. No. 15 was quite a good cider and so was No. 16. No. 17 had a very good aroma and flavour, and No. 18 was generally considered the best cider of the season in the sharp class. Nos. 19 and 21 were fairly good samples of the two well-known varieties, whereas No. 20 was rather inferior. Of the Kingston Blacks, No. 22, 27, 28 and 29 were the best, all being very nice ciders, the rest were somewhat below the standard for this excellent variety.

#### *Sweet Varieties.*

Of the three Eggleton Styres, No. 32 was the best with a very good aroma and flavour. No. 30 was rather dry and thin. Both No. 33 and No. 34 developed ropiness after being in bottle for about 6 months. No. 35 was not quite so good as would be expected for this variety. No. 36, which was tested for the first time, gave a very good cider and promises to be a very useful sweet variety. No. 37 was a very good cider with a pleasant flavour. No. 40 was a good cider, and the same was the case with the two last sweet varieties, of which No. 42 had a rather peculiar but pleasant flavour.

No.	Name of Variety.	District where grown.	Date of Making, 1919.	Specific Gravity of Fresh Juice.	Malic Acid per cent.	Tannin per cent.	Rate of Fermentation at 25° C.	Date of Filtering.	Specific Gravity May, 1920.
APPLES—SHARP VARIETIES.									
1	Jelly ..	..	Oct. 29th	1-052	1-25	.14	9-5	28/1	1-006
2	Butterbox ..	..	Dec. 18th	1-044	.49	.13	4-2	12/2	1-007
3	Gatcombe ..	..	" 22nd	1-053	.50	.13	4-7	16/2	1-007
4	Woodsell ..	..	Nov. 26th	1-052	.69	.11	3-3	1/1	1-015
5	Cap of Liberty	..	" 1st	1-050	.85	.25	3-4	20/1	1-016
6	"	..	" 11th	1-054	.95	.25	3-0	4/2	1-028
7	"	..	" 14th	1-058	.99	.23	4-2	1/1	1-033
8	Cherry Pearmain	..	" 13th	1-056	.57	.26	5-1	29/12	1-017
9	Rank Shooter	..	Dec. 16th	1-051	.76	.15	6-4	16/1	1-019
10	Ponsford ..	..	Nov. 28th	1-050	.66	.11	5-4	6/1	1-019
11	Corpwick ..	..	Dec. 22nd	1-053	.74	.15	2-6	11/2	1-019
12	Foxwelp ..	..	Nov. 11th	1-047	.76	.23	3-1	1/1	1-020
13	"	..	" 12th	1-052	.90	.28	2-2	2/2	1-026
14	Tom Putt ..	..	" 26th	1-049	.56	.14	4-1	17/12	1-022
15	Porter's Perfection	..	" 27th	1-047	.62	.20	3-8	8/1	1-023
16	Bright Red ..	..	" 28th	1-054	.71	.23	3-7	7/1	1-023
17	Crimson King	..	" 21st	1-058	.63	.11	5-6	29/12	1-024
18	Backwell ..	..	" 14th	1-050	.67	.07	3-8	1/1	1-026
19	Frederick ..	..	" 20th	1-053	.84	.10	4-0	5/1	1-027
20	Never Blight ..	..	" 27th	1-050	.96	.28	4-0	9/1	1-030
21	Lambrook Pippin	..	Feb. 3rd	1-047	.61	.11	2-1	1/3	1-030
22	Kingston Black	..	Nov. 13th	1-049	.41	.13	4-0	17/12	1-016
23	"	..	" 7th	1-063	.69	.22	3-2	28/1	1-017
24	"	..	" 12th	1-058	.65	.20	3-1	2/2	1-019
25	"	..	" 7th	1-060	.50	.25	2-9	19/1	1-025
26	"	..	Oct. 29th	1-056	.62	.20	2-5	12/1	1-026
27	"	..	Nov. 17th	1-065	.68	.17	4-3	22/1	1-029
28	"	..	" 1st	1-056	.59	.24	2-0	12/1	1-033
29	"	..	" 11th	1-056	.63	.20	4-0	15/12	1-034

## SWEET VARIETIES.

30	Eggleton Styre ..	Long Ashton ..	..	..	10th	1-038	.26	.12	5.8	29/1	1-005
31	" ..	Ledbury ..	..	..	" 25th	1-060	.31	.18	8.3	31/12	1-018
32	" ..	Ryford ..	..	..	Oct. 31st	1-054	.25	.18	4.5	12/1	1-022
33	Sweet Blenheim ..	Milverton ..	..	..	Nov. 14th	1-051	.28	.10	5.7	15/12	1-010
34	Hancock's Seedling ..	" ..	..	..	" 26th	1-057	.37	.16	3.6	28/1	1-013
35	Slack-ma-Girdle ..	Newton Abbot ..	..	..	Dec. 17th	1-034	.23	.13	3.4	10/2	1-014
36	Hogshead ..	Ryford ..	..	..	" 8th	1-042	.39	.11	4.5	7/1	1-016
37	Red Cluster ..	Alphington ..	..	..	Nov. 20th	1-046	.21	.15	3.7	8/1	1-018
38	Sweet Alford ..	" ..	..	..	" 17th	1-053	.19	.16	3.6	20/1	1-019
39	" ..	Long Ashton ..	..	..	Oct. 21st	1-048	.30	.14	5.2	8/12	1-020
40	Pytheres ..	Dingestow ..	..	..	Nov. 20th	1-046	.28	.17	7.6	15/12	1-023
41	Improved Pound ..	Killerton ..	..	..	" 14th	1-053	.20	.15	4.0	3/1	1-026
42	Red Worthy ..	S. Petherton ..	..	..	" 20th	1-054	.26	.18	2.8	8/1	1-040

## BITTERSWEET VARIETIES.

43	Royal Jersey ..	Long Ashton ..	..	..	13th	1-050	.22	.26	2.0	20/12	1-030
44	Royal Wilding ..	Ledbury ..	..	..	" 25th	1-063	.25	.35	6.7	30/12	1-018
45	Strawberry Norman..	Breinton ..	..	..	Oct. 28th	1-056	.30	.45	5.6	12/1	1-014
46	" ..	Long Ashton..	..	..	Nov. 13th	1-050	.24	.35	5.0	15/12	1-015
47	Master's Jersey ..	N. Cadbury ..	..	..	" 13th	1-053	.25	.39	4.1	31/1	1-008
48	Chisel Jersey ..	S. Petherton ..	..	..	" 27th	1-053	.26	.34	4.5	5/1	1-027
49	White Sweet ..	Kingweston ..	..	..	Oct. 21st	1-049	.23	.32	6.2	8/12	1-008
50	Portfill ..	S. Petherton ..	..	..	Dec. 8th	1-056	.26	.35	5.3	20/1	1-010
51	Dabinett ..	Long Ashton..	..	..	Nov. 17th	1-051	.21	.25	6.5	20/12	1-012
52	" ..	Sherborne ..	..	..	Dec. 19th	1-049	.19	.25	3.6	13/2	1-023
53	Large Sweet ..	Kingweston ..	..	..	Oct. 1st	1-055	.20	.20	3.6	8/12	1-013
54	White Jersey..	Long Ashton ..	..	..	" 2nd	1-048	.21	.18	5.6	8/12	1-015
55	Twistbody Jersey ..	Martock ..	..	..	Nov. 1st	1-052	.35	.33	3.4	20/1	1-019
56	Striped Apple ..	Kingweston ..	..	..	Oct. 29th	1-057	.25	.28	4.0	14/1	1-019
57	Early Bittersweet ..	" ..	..	..	" 6th	1-050	.21	.38	4.5	9/12	1-021
58	Medaille d'Or ..	Killerton ..	..	..	Nov. 13th	1-053	.19	.59	2.8	6/2	1-024
59	Teign Harvey ..	Newton Abbot ..	..	..	Dec. 18th	1-049	.42	.24	2.8	13/2	1-028

No.	Name of Variety.	District where Grown.	Date of Making. 1919.	Specific Gravity of Fresh Juice.	Malic Acid per cent.	Tannin per cent.	Rate of Fermentation at 25° C.	Date of Filtering.	Specific Gravity May, 1920.
<b>BITTERSWEET VARIETIES—<i>contd.</i></b>									
60	White Close Pippin ..	Sutton Montis	Nov. 14th	1.055	.26	.29	5.1	19/12	1.030
61	Greasy Redstreak ..	"	" 14th	1.057	.26	.27	5.0	19/12	1.032
62	White Norman ..	Nunnington ..	" 11th	1.058	.27	.31	3.2	17/12	1.039
<b>PERRIES.</b>									
63	Taynton Squash ..	Ledbury	Oct. 17th	1.048	.36	.07	6.2	8/12	1.009
64	Moccas ..	Breinton	Nov. 1st	1.052	.54	.16	11.0	10/1	1.009
65	Holmer ..	"	" 1st	1.053	.49	.10	8.0	12/1	1.011
66	Barland ..	Ledbury	Oct. 18th	1.057	.69	.34	6.6	12/12	1.018
67	Oldfield ..	"	" 31st	1.061	.60	.15	3.3	30/1	1.025
68	Butt ..	"	" 31st	1.055	.50	.33	3.1	29/1	1.032

*Bittersweet Varieties.*

Six samples in this class, Nos. 44, 46, 51, 53, 60 and 62, were found to be more or less attacked by ropiness after about 8 months in bottle. Unfortunately it is at the present moment impossible to say why so many cases turned up in this particular season. No. 43 was a very good representative of the variety with good body and flavour. No. 45 had a clean rather bitter flavour. No. 47 was somewhat coarse in flavour. No. 48 had a full bitter flavour and was a very useful cider. No. 49 was rather inferior. No. 50 had a pronounced fruity flavour and was a fairly good cider. No. 52 was quite good with good body and flavour. No. 54 was fairly good and No. 55 good with a full bitter flavour. No. 56 (new) was very bitter, but otherwise a good cider. No. 59 had a very aromatic flavour and was one of the best ciders in its class. No. 61 was a good fullbodied cider with good aroma and flavour.

*Perries.*

No. 63 was rather thin and inferior in character. No. 64 and No. 65 were quite good dry perries with good flavour. No. 66 and No. 67 were both fairly good. No. 67 threw down a very heavy deposit, but was otherwise excellent.

---

## XVI.-ANNUAL REPORT OF THE CONSULTING CHEMIST.

(*Dr. J. A. Voelcker, M.A., F.I.C.*)

The number of samples sent by Members during the year has shown an increase on the four samples of 1919, viz., to 20 in 1920. These were :—

Linseed Cake .. .. .	1
Cotton Cake .. .. .	1
Maize Meal .. .. .	1
Dairy Meal .. .. .	2
Basic Slag .. .. .	3
Kainit .. .. .	1
Blast-Furnace Dust .. .. .	2
Lime .. .. .	1
Milk .. .. .	2
Water .. .. .	3
Soil .. .. .	2
Liquid from Silo .. .. .	1

**(a)—FEEDING STUFFS.**

	LINSEED CAKE.	COTTON CAKE.	DAIRY MEAL, No. 1	DAIRY MEAL, No. 2
Moisture .. ..	10.24	10.21	11.32	11.47
Oil .. ..	12.81	5.32	8.42	5.97
Albuminoids	24.62	24.31	23.56	35.25
Carbohydrates, etc	39.73	35.07	35.30	22.91
Woody Fibre	7.25	20.20	13.71	10.84
Mineral Matter	5.35	4.89	7.69	13.56
	100.00	100.00	100.00	100.00
Nitrogen .. ..	3.94	3.89	3.77	5.64
Including Sand and Silica	.53	.29	2.63	1.64

The Linseed Cake was a pure and high quality one. The Cotton Cake also was genuine and good. Of the two Dairy Meals, No. 2 was sold under the name of "Milk Springer Meal" and was composed to a considerable extent, of hop residue and Yeast waste, together with a little linseed. It was distinctly high in nitrogenous matters, but had a very bitter taste, and, though I am assured that, after a time, cattle get accustomed to this, I cannot say that I favour the inclusion of bitter materials of this kind in cakes and meals.

The one sample of Maize Meal was sent because of the seemingly gritty nature of it, which led to a suspicion of sand being mixed with it. This was, however, not found to be the case, the sample being a quite pure and good one.

**(b)—FERTILISERS.****1.—BASIC SLAG.**

	1. per cent.	2. per cent.	3. per cent.
Phosphate of Lime	31.75	20.29	35.55
Fineness .. ..	89.60	96.00	97.00

It will be noticed that these were variable in quality. No. 2 had been bought from a local farmer's company and was stated to be of 30 per cent. quality. The analysis, however, showed it to be nearly 10 per cent. below this. All the samples were finely ground.

**2.—KAINIT AND BLAST-FURNACE DUST.**

	KAINIT. per cent.	BLAST-FURNACE DUST. PORTSLADE. per cent.	GOLDSTONE. per cent.
Potash ..	14.12	18.69	9.53
Silica ..	—	13.26	22.32

The Kainit was of quite good quality, giving Potash equivalent to 26.13 per cent. Sulphate of Potash.

In the case of the Portslade Flue Dust, it was found that some quantity of Cyanides was present, and this constitutes a decided objection.

(c)—LIME.

The one sample of this was of very moderate quality, as the following analysis shows :—

Oxide of Iron and Alumina .. ..	5.70
Lime .. ..	67.95
Magnesia .. ..	.80
Silica .. ..	11.20
Water of Combination, Carbolic Acid, etc. .. ..	14.35
	<hr/>
	100.00

A good sample of burnt Lime should give quite 85 per cent. of Lime (Caustic).

(d)—MILK.

	1.	2.
Water .. ..	90.59	84.70
Fat .. ..	2.50	5.85
Solids-not-fat .. ..	6.91	9.45
	<hr/>	<hr/>
	100.00	100.00

No. 1 was a badly adulterated sample, no doubt by the addition of water. It was very deficient, alike in fat and in total solids.

The second sample of milk was sent because of a disagreeable smell and taste having been noticed with it. The analysis showed the milk to be of decidedly rich quality, nor was there anything disagreeable noticed either in the milk as it reached me, or when the same was made up into butter.

(e)—WATER.

Three samples of water were submitted, but, inasmuch as these were in connection with a question of the possible pollution of a stream, further reference is not made at the present time.

(f)—SOIL.

Two samples of soil were sent for analysis.

The analysis showed them both to be of rich nature rather than otherwise, and so further detailed reference is not called for. In the first instance it was stated that *Trifolium* had failed. The soil was, perhaps, somewhat on the heavy side for *Trifolium*, but there

was nothing in the analysis to indicate any reason for the failure, so far as the soil itself was concerned. It is well-known that *Trifolium* depends very much upon season, and more particularly upon early sowing, this latter being very necessary in order to make sure of a crop.

In the case of the second soil a cause was sought for the prevalence of Buttercups. Here again, the soil was of distinctly rich nature; it contained plenty of lime and was in no sense acid, so that I do not think that the nature of the soil had to do with the complaint. It is well-known that, in certain seasons, Buttercups will appear in profusion, and in other years not.

(g)—LIQUID FROM SILO.

The sample sent me was composed of the drainings collected from a Silo, and it was desired to know whether this would be of any value for feeding purposes. I found the liquid to be composed as follows :—

Water	..	..	..	..	95.48
Total Solids	..	..	..	..	4.52

100.00

The liquid contained Nitrogen .388 per cent. Such a material as this, if there be means of collecting it or of absorbing it by litter, chaff, etc., might quite well be saved for feeding purposes when mixed with other materials. Because of its acid nature it would be well not to use it alone, but it might be diluted with water and poured over a heap of chaff with meal, etc., and so come in useful rather than be wasted.

---



# **APPENDIX.**



# Bath and West and Southern Counties Society.

---

## ALISBURY MEETING, 1920.

---

### JUDGES.

#### HORSES.

- Shire.**—R. H. KEENE, Westfield Farm, Medmenham, Marlow.  
**Suffolk.**—J. M. LONGE, St. Wilfrid's, Northwood, Middlesex.  
**Percheron.**—T. COOK, Hobland House, Bradwell, Great Yarmouth.  
**Hunters and Jumping.**—W. G. LAMBARDE, Bradbourne Hall, Sevenoaks.  
**Ponies.**—REV. E. A. MILNE, Chilfrome, Dorechester.  
**Harness and Saddle.**—C. E. E. COOKE, Bygrave, near Baldock, Herts.

#### CATTLE.

- Devon.**—R. COOK, Craze Lowman, Tiverton.  
**South Devon.**—T. WILLING, Foredown Lodge, Kingskerswell, Devon.  
**Shorthorn and Dairy.**—W. CROSLAND, Estate Office, Buscot Park, Faringdon, Berks.  
**Hereford.**—T. E. BRADSTOCK, Freetown, Tarrington, Hereford.  
**Gloucestershire.**—J. PETER, The Old Rectory, Berkeley, Glos.  
**Sussex.**—H. C. LEE STEERE, Jayes Park, Ockley, Surrey.  
**Red Poll.**—A. D. BRUCE, Estate Office, Elvetham Hall, Winchfield.  
**British Friesian.**—S. WALLACE, Grove House, Hitchin, Herts.  
**Aberdeen-Angus.**—J. MOIR, Goodwood, Chichester.  
**Jersey Bulls.**—J. H. SHORE, Whatley Combe, near Frome.  
**Jersey Cows and Heifers.**—H. WEST HILL, 3, Cursitor Street, London, E.C.4.  
**Guernsey.**—G. BLIGHT, Tregonning, Breaze, Helston.  
**Dexter.**—G. HABGOOD, Somerleigh, Wimborne.  
**Butter Test.**—A. F. SOMERVILLE, Dinder House, Wells, Somerset.  
**Dairy Herds.**—J. CRUMPLER, North Coker, Yeovil.

#### SHEEP.

- Shropshire.**—A. MANSELL, College Hill, Shrewsbury.  
**Devon Longwoolled.**—J. H. GIBBINGS, Week Barton, North Tawton, Devon.

*Judges.*

**South Devon.**—J. HOARE, Mount Barton, Staverton Totnes.

**Kent or Romney Marsh.**—W. W. CHAPMAN, 4, Mowbray House, Norfolk Street, Strand, London, W.C.2.

**Southdown.**—H. SENIOR, Heatherland, Colehill, Wimborne.

**Hampshire Down.**—E. J. BENNETT, Killarney, Carlton Road South, Weymouth.

**Oxford Down.**—H. W. STILGOE, The Grounds, Adderbury, near Banbury, Oxon.

**Dorset Horn.**—J. H. CHICK, Wynford Eagle, Dorchester, Dorset.

**Dorset Down.**—W. C. BARTLETT, Durweston, Blandford, Dorset.

**Exmoor Horn.**—D. J. TAPP, Highercombe, Dulverton, Somerset.

## PIGS.

**Berkshire.**—R. B. VINCENT, Waterston Manor Farm, Dorchester.

**Large Black.**—W. WILLS, Marlwood, Thornbury, Glos.

**Large and Middle White, and Wessex Saddleback.**—A. HISCOCK, Manor France Farm, Blandford, Dorset.

**Gloucestershire Old Spots.**—E. G. F. WALKER, The Hollies, Chew Stoke, Bristol.

## PRODUCE.

**Bottled Fruit.**—Miss K. M. THORNBERRY, County Offices, Trowbridge.

**Cider.**—J. H. WOOTTON, Byford, Hereford.

**Cheese.**—W. CARY, Shepton Mallet, Somerset.

**Cream Cheese, Butter and Cream.**—Mrs. A. M. LUKE, 9, St. James' Place, The Hoe, Plymouth.

## COMPETITIONS.

**Butter-making.**—T. LATHAM, Bishop's Court, Dorchester, Oxon, and Mrs. A. M. LUKE, 9, St. James' Place, The Hoe, Plymouth.

**Milking.**—S. HODDINOTT, Woodford, Wells, Somerset.

**Shoeing.**—F. BAZLEY, M.R.C.V.S., 5, Estcourt Street, Devizes, Wilts.

## POULTRY.

CLEM. WATSON, Oxhey, Watford, and T. C. HEATH, Keele, Newcastle, Staffs.

## FORESTRY.

Professor H. A. PRITCHARD, 76, Castle Street, Cirencester.

## PRIZE AWARDS, 1920.

---

\* \* An animal designated in this list as the "reserve number" is entitled, *conditionally*, to succeed to any prize that may become vacant in its class by reason of the animal placed above it by the Judges failing afterwards to qualify.

† Animals where not otherwise stated, may be considered to have been bred by the Exhibitor.

ABBREVIATIONS EXPLAINED:—S., sire; d., dam; s.d., sire of dam; y., year; m., month; w., week; d., day; R., Reserve; V.H.C., Very Highly Commended; H.C., Highly Commended; C., Commended.

---

£100 towards the Prizes in the Horse, Cattle, Sheep and Pig Classes were contributed by the Wilts Agricultural Association and were allocated to Classes 1, 15, 74, 122 and 173.

---

### HORSES.

#### SHIRE.

(Registered or eligible for registration in the Shire Horse Society's Stud Book).

CLASS 1.—*Shire Mare, in-Foal, or with Foal at foot. First prize, £15—second, £10—third, £3. [5 entries.]*

[NO AWARD.]

CLASS 2.—*Shire Filly or Gelding, foaled in 1919. [3 entries.]*

I. (£10.)—W. J. CUMBER, Theale, Berks, bay filly, **Theale Rosebowl**; s Norbury Menestrel (23453), d Lockinge Rosa (61016), s d Lockinge Sweet William (20654).

II. (£5.)—O. WILLIAMS, Crossways, Cowbridge, bay filly, **Pendley Golden Melody**, bred by J. G. Williams, Pendley Manor, Tring, Herts; s Babingley Nulli Secundus (26993), d Tasley Lady Redlynch (76186), s d Redlynch Forest King (23626).

III. (£3.)—CO-OPERATIVE WHOLESALE SOCIETY, LTD., Estate Office, Cherhill, Calne, bay filly, **Wholesale Expectation**; s Theale Lockinge (35246), d Finstall Heather (60354), s d Beaumont Tartar (23027).

CLASS 3.—*Shire Filly or Gelding, foaled in 1918. [5 entries.]*

I. (£10.)—O. WILLIAMS, Crossways, Cowbridge, Glam., bay filly, **Crossways Forest Maid**, bred by F. Farnsworth & Sons, Shawell, Cirencester; s Friar Tuck 4th (31447), d Brockhall Primrose (47333), s d Lockinge Forest King (18867).

**II. (25).**—W. H. PALMER, Stoke's Farm, Wokingham, Berks, brown filly, **Stoke's Coming Queen**; s Sundridge Coming King (33568), d Monk's Green Brilliant (82308), s d Norbury Menestrel (23543).

**III. (23).**—W. J. CUMBER, Theale, Berks., bay filly, **Burghfield Goldshell**, bred by J. Lousley, Green Farm, Burghfield; s Theale Menestrel (34380), d Goldshell (81535), s d Champion Clansman (29221).

**R.**—E. R. DEBENHAM, Bladen Dairy Farm, Affpiddle, Dorset, bay filly, **Lymm Myrtle**, bred by G. and F. Hutchinson, Foremark Park, Ticknall, Derby; s Lym Rival (34941), d Myrtle, s d Dunmore North Star (22313).

#### CLASS 4.—*Shire Filly or Gelding, foaled in 1917.* [6 entries.]

**I. (210).**—O. WILLIAMS, Crossways, Cowbridge, Glam., bay, **Edgcote Whitesocks**, foaled 1917, bred by Edgcote Shorthorn Co., Ltd., Edgcote, Banbury; s Normanby Jesse (32675), d Horning Whitesocks (T1167), s d Woodreeve (24772); in foal.

**II. (25).**—MAJOR R. W. COOPER, M.C., Eling House, Hermitage, Berks, bay filly, **Rouington Water Lily** (95294), bred by B. Farrow, Hawton Grange, Newark; s Ware Coming King (33616), d Cotham Beness (44593), s d Yorkshire Ben (16479).

**III. (23).**—CO-OPERATIVE WHOLESALE SOCIETY, LTD., Estate Office, Cherhill, Calne, bay filly, **Tarnacre Violet**, bred by J. E. and A. W. Porter, Tarnacre House, Garstang; s King's Choice (32509), d Picotee (68165), s d Catthorpe Damion (23147).

**R.**—E. R. DEBENHAM, Bladen Dairy Farms, Affpiddle, Dorset, bay filly, **Blackhurst Modesty** (91547), bred by Mrs. M. Francis, Lower Leighton, Welshpool; s Moors Kitchener (25443), d Leighton Heiress (64181), s d Childwick Champion (22215).

**H.C.**—E. R. DEBENHAM, bay filly, **Tangmere Forest Girl** (95937), bred by G. Bayley, Tangmere, Chichester; s Primley Benefactor (28680), d Tangmere Forest Queen (72685), s d Warton Forest King (23725).

#### CLASS 5.—*Shire Stallion, foaled before 1918.* [3 entries.]

**I. (215).** W. J. CUMBER, Theale, Berks, brown, **Theale St. Clair** (35248), foaled 1916, bred by C. G. Bicknell Elcombe, Swindon; s Theale Champion (31829), d Hilmarton Pansy (42214), s d Cricklade Willow (20394).

**II. (210).**—F. W. PARSONS & SON, Manor Farm, Speckington, Ilchester, bay, **Speckington King Cole 8th** (35212), foaled 1916; s King Cole 7th (26351), d Lubenham Depper (78665), s d Babingley Nulli Secundus (26993).

#### CLASS 6.—*Shire Stallion, foaled in 1918.* [2 entries.]

**I. (215).**—W. J. CUMBER, Theale, Berks, brown, **Theale Victory** (Vol. xli), s Champion's Chancellor (33095), d Lockinge Rosa (61066), s d Lockinge Sweet William (20654).

**II. (210).**—DR. WILSON, Hill Manor Shire Stud, Hinton Parva, Swindon, dark brown, **Day House Menestrel** (Vol. xli), bred by C. Horton, Day House, Coate, Swindon; s Menestrel Boy 4th (31656, Vol. xxxv), d Day House Josephine (88157, Vol. xxxix).

**CLASS 7.—Shire Colt, foaled in 1919. [3 entries.]**

**I. (£15.)**—W. J. CUMBER, Theale, Berks, bay, **Theale Justice**, bred by E. H. Buncombe, Wellington, Somerset; s Champion's Chancellor (33095), d Longforth White Heather (78649), s d King Cole 7th (26351).

**II. (£10.)**—DR. WILSON, Hill Manor Shire Stud, Hinton Parva, Swindon, black, **Hill Manor Drayman**, bred by F. Hurling, Sutton St. Edmunds', Wisbech, Cambs.; s Goadby Drayman (27367), d Wolley (76541), s d New Cut Pilot (24490).

**CLASS 8.—Shire Foal, produce of Mare in Class. First prize, £5—second, £3. [4 entries.]**

[NO AWARD.]

**MEDAL.**

GIVEN BY THE SHIRE HORSE SOCIETY.

*A Gold Medal, or the sum of £10, for the best Mare or Filly in the Shire Horse Classes, under Conditions 47, and to the Breeder of the winner under the Conditions stated, a prize of £5.*

**I.**—MAJOR R. W. COOPER, M.C., Eling House, Hermitage, Berks, bay filly, **Rouington Water Lilly** (95294), bred by B. Farrow, Hawton Grange, Newark; s Ware Coming King (33616), d Cotham Beness (44593) s d Yorkshire Ben (16479).

**SUFFOLK.**

(£36 towards the Prizes in Classes 9 to 12 was contributed by the Suffolk Horse Society).

**CLASS 9.—Suffolk Filly, foaled in 1918. [6 entries.]**

**I. (£10.)**—THE MARCHIONESS OF GRAHAM, Easton Park, Wickham Market, Suffolk, chestnut, **Hawstead Sweetbriar**, bred by S. Fitzroy, Hawstead Lodge, Bury St. Edmunds; s Hasketon Prince of Orange (4282), d Rose (6990), s d Fornham Comet (3371).

**II. (£5.)**—THE MARCHIONESS OF GRAHAM, chestnut, **Hawstead Flossie**, bred by S. Fitzroy, Hawstead Lodge, Bury St. Edmunds; s Hasketon Prince of Orange (4282), d Hasketon Flo (7076), s d Sproughton Gold Ring (3347).

**III. (£3.)**—SIR C. QUILTER, BART., Bawdsey Manor, Woodbridge, chestnut, **Bawdsey Hermione** (9908); s Bawdsey Varlet (4390), d Sutton Venus (5693), s d Hewitt's Mars (2434).

**R.**—E. R. DEBENHAM, Bladen Dairy Farms, Affpiddle, Dorset, red chestnut, small star, **Bladen Graceful** (10484); s Marston Laddie 2nd (4221), d Cockfield Gracious 2nd (7446), s d Ashmoor Brogue (5751).

**CLASS 10.—Suffolk Filly, foaled in 1917. [1 entry.]**

**I. (£10.)**—SIR C. QUILTER, BART., Bawdsey Manor, Woodbridge, chestnut, **Bawdsey Hayseed** (9496); s Bawdsey Hay (4188), d Cliff Blossom (6180), s d Boulge Conqueror (2667).

**CLASS 11.—Suffolk Stallion, foaled in 1917. [1 entry.]**

**I. (210.)**—THE MARCHIONESS OF GRAHAM, Easton Park, Wickham Market, Suffolk, chestnut, **Easton Sheik**; s Sudbourne Arabi (3287), d Easton Sultana (9115), s d Sudbourne Sultan (3224).

**CLASS 12.—Suffolk Stallion, foaled in 1918. [4 entries.]**

**I. (210.)**—A. C. SMITH, Sutton Hall, Woodbridge, Suffolk, chestnut, **Shotley Beau** (4773), bred by K. M. Clark, Sudbourne; s Sudbourne Beau Brocade (4235), d Sudbourne Lady (5574), s d Rendlesham Goldsmith (3095).

**II. (25.)**—SIR C. QUILTER, BART., Bawdsey Manor, Woodbridge, chestnut, **Bawdsey Knave of Diamonds** (4837; s Bawdsey Varlet (4390), d Bawdsey Jewel (6485), s d Sudbourne Count (3257).

**III. (23.)**—SIR C. QUILTER, BART., chestnut, **Bawdsey Rake** (4833); s Bawdsey Varlet (4390), d Bawdsey Saucy Fairy (6659), s d Bawdsey Saucy Lad (3331).

**PERCHERONS.**

(£18 towards the Prizes in Classes 13 and 14 was contributed by the British Percheron Horse Society).

**CLASS 13.—Percheron Mare, any age, with foal or barren. [8 entries.]**

**I. (210.)**—SIR H. HOARE, BART., Stourhead, Zeals, Wilts., black, **Origine** (34), foaled 1914, bred by M. Vieux, Bellme, Gue-de-la-Chaim, L'Ome, France; s Josne F (88841), d Injure F (80008), s d Gendarme F (63132).

**II. (25.)**—SIR E. HAMBRO, K.C.V.O., Milton Abbey, Dorset, grey, **Ostram**, foaled 1914, bred by M. Jamois, La Reiniere, Mortague, France; s Judds (86606), d Jayles (85856), s d Croquis (68451); with foal by Mamin

**III. (23.)**—LIEUT.-COL. SIR M. BURRELL, BART., C.B.E., Knepp Castle, Sussex, grey, **Palombe** (29 B.P.H.S.), foaled 1915; s Irradie, d Montree, s d Valory; with foal by Noel.

**R.**—A. W. HANDY, Haycroft, Sherborne, Glos., grey, **Poachontas Belle** (129), foaled 1916, bred by L. A. McGrew, Adair, Illinois, U.S.A.; s Damala (27352), d Juanita (93762), s d Seducteur (61287).

**V.H.C.**—SIR H. HOARE, BART., grey, **Livourne** (35), foaled 1911, bred by M. Cassé, Petites Binetieres, St. Maiscent, Montmiral, La Sarthe, France; s Houleux F (74223), d Bleue F (49492), s d Fier-a-Bras F (13555).

**CLASS 14.—Percheron Stallion, any age. [6 entries.]**

**I. (210.)**—THE "HACHE" STUD, Bulstrode, Gerrards Cross, Bucks, and Muntham Court, Worthing, Sussex, dark grey, **Quapulet** (31), foaled 1916, bred by M. Crenier, Nogent-le-Rotrou; s Languier F (100640), d Hermine F (73775), s d Guibet F (57895).

**II. (25.)**—CAPTAIN R. B. BRASSEY, M.F.H., Heythrop Park, Chipping Norton, Oxon., dark grey, **Onuphre** (141963), foaled 1914, bred by M. Dor-douque, Eure et Loir; s Jasminc (83835), d Insulte (78662), s d Tardif (77879).



**III. (23.)**—LIEUT.-COL. SIR M. BURRELL, BART., C.B.E., Knepp Castle, Horsham, grey, **Omer** (67, B.P.H.S.), foaled 1915.

**E.**—MAJOR C. P. ACKERS, Huntley Manor, Gloucester, grey, **Quorail** (13018), foaled 1916, bred by M. Prince, La Vallée, St. Martin Les Monts, France; s Kalot (92507), d Sidonie (66922), s d Cosagne (52134).

## HUNTERS.

**CLASS 15.**—*Hunter Mare, in-Foal, or with Foal at foot.* [4 entries.]

**I. (215.)**—G. F. TILLEY, Alstone Court, Huntspill, near Bridgwater, chestnut, **Primrose**; with foal by Passport.

**II. (210.)**—H. LE D. SPENCELY, Ashley House, Box, Wilts, chestnut, **Semiramis** (late **Osoosweet**). (4596 H.I.S.B., Vol. vii.); s Killyleagh; with foal by Aerschot.

**III. (23.)**—H. LE D. SPENCELY, chestnut, **Flame** (5246, H.I.S.B., Vol. viii), foaled 1916; s Ampelion, d Semiramis, s d Killyleagh; with foal by Aerschot.

## MEDALS.

GIVEN BY THE HUNTERS' IMPROVEMENT AND NATIONAL LIGHT HORSE BREEDING SOCIETY, UNDER CONDITIONS 48.

*A Gold Medal, or £5 and a Bronze Medal, for the Best Hunter Brood Mare in Class 15, registered with a number in the Hunter Stud Book, at the time of entry or within a month of the award, not having previously won the above-named Society's Gold Medal as a Brood Mare in 1920, and which must have her foal at foot, or produce a living foal in 1920 to a thoroughbred horse or Registered Hunter sire. In the second instance a certificate to that effect must be forwarded before the Medal is sent. Only prize winners in the class were eligible for these medals.*

**I.**—G. F. TILLEY, Alstone Court, Huntspill, near Bridgwater, chestnut, **Primrose**; with foal by Passport.

**CLASS 16.**—*Hunter Filly, Colt or Gelding, foaled in 1919.* [2 entries.]

**I. (210.)**—W. P. BRIDGMAN & SONS, Court Farm, Collingbourne Ducis, Wilts, chestnut filly, **Collingbourne Beauty**; s Total Abstainer, d Highfield Beauty.

**CLASS 17.**—*Hunter Filly, Colt or Gelding, foaled in 1918.* [3 entries.]

**I. (210.)**—SIR E. D. STERN, Fan Court, Chertsey, Surrey, bay gelding, **Smuts** (420, Vol. ix.); s Dundreary, d Brunette.

**II. (25.)**—THE HON. H. MONEY-COUTTS, Sandle Manor, Fordingbridge, bay colt, **Squareface**; s Hanover Square, d Kathleen, s d Kano.

**III. (23.)**—LADY K. MORANT, Brokenhurst Park, Hants, chestnut gelding, **Adrift**, bred by Mrs. Leatham, The Manor, Bagendon, Cirencester; s Ashore, d Nona.

**CLASS 18.—*Hunter Filly or Gelding, foaled in 1917* [3 entries.]**

**I. (£10.)**—C. THOMAS, Red Lion Hotel, Salisbury, chestnut gelding, **White Socks**; s Egret.

**CLASS 19.—*Hunter Mare or Gelding, foaled in 1916.* [3 entries.]**

**I. (£10.)**—R. H. HUNT, Midgham, Fordingbridge, chestnut gelding, **Thistle-top**, bred by A. Hunt, Woodfalls Farm, Downton; s Thistledown.

**II. (£5.)**—THE HON. H. MONEY-COUTTS, Sandle Manor, Fordingbridge, bay mare, **Shady Girl**; s Rockaway, d Gaiety Girl 2nd, s d Newmarket.

**CLASS 20.—*Hunter Mare or Gelding, foaled before 1917, to carry under 14 stone.* [6 entries.]**

**I. (£20.)** J. K. STEVENSON, The Chase, Upper Welland, Malvern Wells, chestnut gelding, **Fieldmint**, foaled 1913, bred by W. Brown, Slingsby, near Malton, Yorks; s Faeldsham, s d Peppermint.

**II. (£10.)**—MAJOR H. FAUDEL PHILLIPS, Stoney Ware, Marlow, bay gelding, **Gentleman Joe**, foaled 1916; s Hanover Square.

**III. (£3.)**—CAPTAIN C. ROBINSON, M.C., Moor Wood, Cirencester, Glos., brown gelding, **Firelighter**, foaled 1911, bred by J. S. Helliwell, Lydiate Summerhill, Maghull, near Liverpool; s Lord George, d Miss Brice, s d All Moonshine.

**R.**—H. T. TIMSON, Stydd House, Lyndhurst, Hampshire, chestnut gelding, **Pussyfoot**, foaled 1915, bred by Dr. Jolliff, Isle of Wight; s Gay Middleton.

**H.C.**—R. H. HUNT, Midgham, Fordingbridge, chestnut gelding, **Thistle-top**, bred by A. Hunt, Woodfalls Farm, Downton; s Thistledown.

**CLASS 21.—*Hunter Mare or Gelding, foaled before 1917, to carry 14 stone or over.* [6 entries.]**

**I. (£20.)**—MAJOR H. FAUDEL PHILLIPS, Stoney Ware, Marlow, chestnut gelding, **Liffey Bank**, foaled 1915, bred by the Earl of Kenmar; s Bean's Cap, d Prima Donna, s d Scene Shifter.

**II. (£10.)**—SIR E. D. STERN, Fan Court, Chertsey, Surrey, brown gelding, **Botha** (367, Vol. viii), foaled 1915; s Dundreary, d Brunette.

**III. (£3.)**—J. K. STEVENSON, The Chase, Upper Welland, Malvern Wells, bay gelding, **Royal Flush**, 6 yrs.; s Outbreak, s d Protector.

**R.**—F. FEAR, Mark, Highbridge, brown gelding, **Shamrock**, foaled 1915, bred by H. A. Marks, Webbington, Axbridge; s Stronard.

**H.C.**—J. OSMOND, West Stafford, near Dorchester, bay gelding; **Anchor**, foaled 1913, bred by — Cox, Beaminster; s Anchorite's Son.

**C.**—J. H. BETTS, Quarry Farm, Northfield, Birmingham, chestnut gelding, **Pol Roger**, foaled 1916, bred by — Mabin, near Ballymena, Co. Antrim; s Thorny, s d by Mascarille.

**CLASS 22.**—*Hunter Mare or Gelding, foaled before 1917, that had not won a Prize of £10 or over under saddle at any Show held previous to April 2, 1920. [10 entries.]*

**I. (£10.)**—MAJOR H. FAUDEL PHILLIPS, Stoney Ware, Marlow, bay gelding, **Gentleman Joe**, foaled 1915 ; s Hanover Square.

**II. (£5.)**—J. K. STEVENSON, The Chase, Upper Welland, Malvern Wells, bay gelding, **Royal Flush**, 6 yrs. ; s Outbreak, s d Protector.

**III. (£3.)**—CAPTAIN C. ROBINSON, M.C., Moor Wood, Cirencester, Glos. brown gelding, **Firelighter**, foaled 1911, bred by J. S. Helliwell, Lydiate, Summerhill, Maghull, near Liverpool ; s Lord George, d Miss Brice, s d All Moonshine.

**R.**—H. T. TIMSON, Stydd House, Lyndhurst, Hampshire, chestnut gelding, **Pussyfoot**, foaled 1915, bred by Dr. Jolliff, Isle of Wight ; s Gay Middleton.

**H.C.**—F. FEAR, Mark, Highbridge, brown gelding, **Shamrock**, foaled 1915, bred by H. A. Marks, Webbington, Axbridge ; s Stronard.

**C.**—J. OSMOND, West Stafford, near Dorchester, bay gelding, **Anchor**, foaled 1913, bred by — Cox, Beaminster ; s Anchorite's Son.—R. H. HUNT, Midgham, Fordingbridge, chestnut gelding, **Thistletop**, bred by A. Hunt, Woodfalls Farm, Downton ; s Thistledown.

**CLASS 23.**—*Hunter Foal, produce of Mare in Class 15. First prize, £5—second, £3. [2 entries.]*

[NO AWARD].

### MEDAL.

GIVEN BY THE HUNTERS' IMPROVEMENT AND NATIONAL LIGHT HORSE BREEDING SOCIETY, UNDER CONDITIONS 49.

*A Silver Medal or £1 (at the option of the winner), for the Best Hunter Mare or Gelding of any age, exhibited by a member of the Hunters' Improvement and National Light Horse Breeding Society, whose subscription to that Society must be paid within a month of the award.*

*Only prize-winners in the Classes were eligible for these Medals.*

**I.**—SIR E. D. STERN, Fan Court, Chertsey, Surrey, brown gelding, **Botha** (367, Vol. viii), foaled 1915 ; s Dundreary, d Brunette.

**R.**—H. LE D. SPENCELY, Ashley House, Box, Wilts, chestnut, **Semiramis** (late **Ososweet**) (4596 H.I.S.B., Vol. vii.) ; s Killyleagh ; with foal by Aer-schot.

### PONIES.

**CLASS 24.**—*Mare, not exceeding 14.2 hands, suitable to breed Polo or Riding Ponies, in-Foal, or with Foal at foot. First prize, £8—second, £4—third, £2. [2 entries.]*

[NO AWARD.]

**CLASS 25.**—*Pony Filly, Colt or Gelding, foaled in 1919. [5 entries.]*

**I. (48.)**—MAJOR H. FAUDEL PHILLIPS, Stoney Ware, Marlow, chestnut filly, **Post Bellum**; s Stortford, d Tarantella, s d Turgot.

**II. (44.)**—MAJOR J. S. BAKEWELL, Cromhall, Charfield, Glos., chestnut colt, **Flutter** (Supp. N.P.S.B.); s John Lambton, d Flu (2908. N.P.S.B.), s d White Wings (464 N.P.S.B.).

**III. (42.)**—C. R. SNELL, 63, Fisherton Street, Salisbury, skewbald Shetland gelding, **Britford Charlie**; s Kingsetter (503 Vol. xxvi., p. 25 S.S.B.), d Falabar (Vol. xxvi, p. 25), s d Besieger (235).

**R.**—J. F. DOWNS, East Harnham Dairy Farm, Salisbury, chestnut filly, **Beauty**.

**CLASS 26.**—*Pony Filly, Colt or Gelding, foaled in 1918, not exceeding 14.2 hands. First prize, £8—second, £4—third, £2.*

[No ENTRY]

**CLASS 27.**—*Pony Filly, Colt or Gelding, foaled in 1917, not exceeding 14.2 hands. First prize, £8—second, £4—third, £2.*

[No ENTRY.]

**CLASS 28.**—*Stallion, not exceeding 15 hands, suitable to get Polo or Riding Ponies. [2 entries.]*

**I. (48.)**—H. R. PELLY, Lynday's Farm, Ingatestone, Essex, chestnut, **Aviator**, foaled 1913, bred by Miss S. M. Corbett, Stableford, Budgnorth; s White Wings (464), d Telegram (2341).

**CLASS 29.**—*Foal, the produce of Mare in Class 24. First prize, £4—second, £2. [1 entry.]*

[No AWARD.]

### MEDALS.

OFFERED BY THE NATIONAL PONY SOCIETY.

*A Silver Medal for the best Polo Pony Brood Mare in the Brood Mare Class, registered or eligible for registration in the Stud Book.*

[No AWARD.]

*A Silver Medal for the best Polo Pony Stallion, registered or eligible for registration in the Stud Book; or best Polo Pony Entire Colt, one, two or three years old, entered or eligible for the Supplement, viz., by a Registered or Entered Sire, or out of a Registered or Entered Dam.*

[No AWARD.]

*These Medals were offered subject to Condition No. 51.*

**NEW FOREST PONIES.**

(The Prizes in Classes 30 to 32 were given by or through the New Forest Pony Society).

**CLASS 30.**—*New Forest Pony, Mare or Gelding, under 4 years old.*  
*First prize, £5—second, £3—third, £2.*

[NO ENTRY.]

**CLASS 31.**—*New Forest Mare and three Colts or Fillies, under 5 years old, the produce of the Mare. First prize, £5—second, £3—third, £2.*

[NO ENTRY.]

**CLASS 32.**—*New Forest Pony Stallion, foaled before 1919.* [2 entries.]

**I. (£5).**—MISS H. C. METCALFE, Lamyatt, Evercreech, **Staple Cross Fleet-foot** (207 N.F.S.B., 652 N.P.S.B., New Forest Section), foaled 1911, bred by W. Burry, Staple Cross Farm, Christchurch, Hants; s Staple Cross Quick-silver (179 N.F.S.B.), d Tiny (535 N.F.S.B.).

**II. (£3).**—J. F. BOWNS, East Harnham Dairy Farm, Salisbury, brown, **Nimble Joe**, foaled 1909, bred by T. Dibben, Bramshaw, Hants.

**HARNESS AND SADDLE.**

**CLASS 33.**—*Mare or Gelding, not over 14.2 hands, to be driven in harness on the 1st day of the Show.* [2 entries.]

**I. (£10).**—A. AND C. SNOW, Rodbourne Hackney Stud, Swindon, bay gelding, **Rodbourne Blighty**; s Polonius (4931), d Melbourne Bell (19338).

**CLASS 34.**—*Mare or Gelding, any height, for riding purposes, shown in saddle on the 1st day of the Show.* [7 entries.]

**I. (£10.)** MAJOR H. FAUDEL PHILLIPS, Stoneyware, Marlow, chestnut gelding, **As You Were**, bred by M. Angus, Lissen Hall, Nenagh, Ireland; s Cresthampton, s d Louis 14th.

**II. (£5).**—CAPTAIN C. ROBINSON, M.C., Moor Wood, Cirencester, Glos., brown gelding, **Firelighter**, foaled 1911, bred by J. S. Helliwell, Lydiat Summerhill, Maghull, near Liverpool; s Lord George, d Miss Brice, s d All Moonshine.

**III. (£2).**—MRS. JOHN HESELTINE, Etchilhampton House, Devizes, bay mare, **Greedy**.

**CLASS 35.**—*Mare or Gelding, 15 hands or over, driven in harness on the 2nd day of the Show.* [4 entries.]

**I. (£10).**—MISS S. BROCKLEBANK, Wing Grange, Oakham, grey gelding, **Optimistic**, foaled 1905, bred by M. Davey, Malsmyan Hall, Flintshire; s Kassimede (8207).

**CLASS 36.**—*Pony, not exceeding 13.2 hands, suitable for, and ridden by, a child not over 14 years of age, on the 2nd day of the Show.* [7 entries.]

**I. (25).**—MASTER N. RICHARDS, Elmdone, South Street, Sherborne, grey, **Daisy**.

**II. (23).**—J. CROSS, Penn Mill Farm, Bourton, Dorset, bay mare, **Kit**, foaled 1914.

**III. (21).**—MISS A. C. CLAYTON, The Manor Cottage, Burley, near Brockenhurst, Hants, black mare, **Ioto** (2510), foaled 1909, bred by Mrs. E. Bailly, Horrabridge, Devon; s Dartmoor, d Doxey Black.

**R.**—G. F. WILSON, Winterbourne-Kingston, Blandford, chestnut gelding, **Merry**, foaled 1913.

**H.C.**—R. H. HUNT, Midgham, Fordingbridge, bay mare, foaled 1914, bred by - Bullock, Hordle, Lymington.

**CLASS 37.**—*Mare or Gelding, over 14.2 and under 15 hands, driven in harness on the 3rd of the Show.* [2 entries.]

**I. (210).**—G. H. TERRY, Wessex Villa, Odiham, Hants, chestnut gelding, **King's Herald** (G112), foaled 1914, bred by J. N. Reynard, Manuel House, Linlithgow, N.B.; s Mathias (6473), d Belle Mahone, s d Danebury (4724).

**CLASS 38.** *Trotting. Best Mare, Stallion or Gelding, not exceeding 14.3 hands, for speed, driven in harness on the 3rd day of the Show.* [1 entry.]

**I. (210).** The late W. WINANS, Carlton Hotel, Pall Mall, London, bay mare, **Henrietta Guy**, foaled 1916, bred by Hudson River Stock Farm; s Guy Adworthy, d Lady Henrietta, s d Peter O'Dourna.

**CLASS 39.**—*Tandems, Mares or Geldings, shown in Harness on the 4th day of the Show.* [2 entries.]

**I. (210).**—MISS S. BROCKLEBANK, Wing Grange, Oakham, grey gelding, **Optimistic**, foaled 1905, bred by M. Davey, Malsmyan Hall, Flintshire; s Kassimede (8207), and bay gelding, **Illumination**, foaled 1906, bred by the Right Hon. Frederick Wrench, Killacoon, Ballybrack, Co. Dublin; s Blaze 2nd (2376), d Bay Clara (14120).

**II. (25).**—CAPTAIN B. W. MILLS, Redhill Farm, Edgware, Middlesex, black gelding, **Black Vogue**, foaled 1912, bred by J. Prentice, Carolside, Uddington, N.B.; s Mathias (6473), d Inverness Duchess of Connaught (15192), s d Garton Duke of Connaught, and black gelding, **Grand Viscount**, bred by G. Ross, Dykehead, Capeltown, N.B.; s Mathias (6473), d Maid of Honour (1243), by Confidence (163).

**CLASS 40.**—*Pairs of Mares or Geldings, shown in Harness on the 4th day of the Show.* [1 entry.]

**I. (210).**—CAPTAIN B. W. MILLS, Redhill Farm, Edgware, Middlesex, black gelding, **Black Vogue**, foaled 1912, bred by J. Prentice, Carolside, Uddington,

N.B. ; s Mathias (6473), d Inverness Duchess of Connaught (15192), s d Garton Duke of Connaught, and black gelding, **Grand Viscount**, bred by G. Ross, Dykehead, Chapelton, N.B. ; s Mathias (6473), d Maid of Honour (1243), by Confidence (163).

(The Prizes in Classes 226, 227 and 228 were given by the Salisbury Local Committee).

**CLASS 226.**—*Cart Mare or Gelding, the property of a Tradesman carrying on business within a radius of six miles of Salisbury Post Office, used solely by him and driven regularly by himself or his servants for the delivery of goods sold by him, or for the purpose of carrying on his business, for a period of not less than three months prior to May 28th, 1920, shown in a wagon, trolley, or cart on the 4th day of the Show. First prize, £5 second, £2—third, £1. [1 entry.]*

*(Any Company or Public Body, subject to the above qualifications, were eligible for this Class).*

[NO AWARD.]

**CLASS 227.**—*Light Mare or Gelding, the property of a Tradesman carrying on business within a radius of six miles from Salisbury Post Office, used solely by him and driven regularly by himself or his servants for the delivery of goods sold by him, or for the purpose of carrying on his business, for a period of not less than three months prior to May 28th, 1920, shown in a wagon, trolley or cart on the 4th day of the Show. [6 entries.]*

*(Any Company or Public Body, subject to the above qualifications were eligible for this Class).*

**I. (25).**—A. PRITCHETT, 5, Fish Row, Salisbury, brown, **Tom**.

**II. (22).**—C. HASKELL.

**III. (21).**—G. MOULD & SONS, 17, Rolleston Street, Salisbury, cream mare, **Mary**.

**R.**—S. ROBBINS, Trinity Street, Salisbury, chestnut gelding, **Little Mischief**.

**CLASS 228.**—*Pair of Cart Mares or Geldings, or Mare and Gelding, the property of any Farmer residing within a radius of 20 miles of Salisbury Post Office, used solely by him and driven regularly by himself or his servants, for the purpose of farming, for a period of not less than three months prior to May 28th, 1920, shown in a Wiltshire boat wagon on the 4th day of the Show. [5 entries.]*

**I. (25).**—E. J. TAUNTON, Bemerton, Salisbury, bay gelding, **Captain**, and chestnut gelding, **Prince**.

**II. (22).—**H. R. HARDING, Bretford, Salisbury, dark bay mare and light bay gelding, **Darby and Drummer**, foaled 1912 and 1915.

**III. (21).—**H. R. HARDING, bay mare and bay gelding, **Short and Flower**, foaled 1913 and 1915.

**R.—**E. J. TAUNTON, bay geldings, **Punch and Nelson**.

**CLASS 41.—***Mare or Gelding, not over 13.2 hands, driven in harness on the 5th day of the Show. [4 entries.]*

**I. (210).—**G. H. TERRY, Wessex Villa, Odiham, Hants, bay gelding, **High Explosive** (G113), foaled 1915, bred by J. Blakelock, Falinge Pony Stud, Rochdale; s Southworth Swell (12164), d Hollin Glow Worm (22616), s d Torchfire (9472).

**II. (25).—**E. GRIFFIN, 9 and 10, Church Street, Basingstoke, brown gelding, **Braishfield Razzle**, 4y., bred by Mrs. King, Braishfield Manor, Romsey; s Tissington Gideon (9042), d Tissington Ripple, s d Sir Horace (5402).

**III. (22).—**MAJOR C. A. WELLS, O.B.E., Reddish House, Broad Chalke, near Salisbury, chestnut gelding, **Maywic**, foaled 1907 or 1908.

**CLASS 42.—***Trotting. Best Mare, Stallion or Gelding, exceeding 14.3 hands, for speed, driven in harness on the 5th day of the Show. [3 entries.]*

**I. (210).—**G. M. BERESFORD-WEBB, Norbryght, South Godstone, Surrey, bay stallion, **Sir Todd 2nd**, foaled 1912; s Sir Todd, d Nonita.

**II. (25).—**G. M. BERESFORD-WEBB, chestnut mare, **Mistle Thrush**, foaled 1914; s Axworthy, d Mantua Maker, s d Red Wilkes.

**III. (22).—**The late W. WINANS, Carlton Hotel, Pall Mall, London, bay gelding, **Doctor Work** (Record, 2.18½), foaled 1916, bred by W. F. Macallister, Lexington, Kentucky, U.S.A.; s Mr. Work (59408, Record 2.19½), d Nantoon, s d Dr. Monson (40570).

## MEDAL.

GIVEN BY THE HACKNEY HORSE SOCIETY.

*A Silver Medal for the best Mare or Gelding exhibited in Single Harness in Classes 33 to 42, subject to Conditions 50.*

**I.—**MISS S. BROCKLEBANK, Wing Grange, Oakham, grey gelding, **Optimistic**, foaled 1905, bred by M. Davey, Malsmyan Hall, Flintshire; s Kassimede (8207).

**R.—**G. H. TERRY, Wessex Villa, Odiham, Hants, bay gelding, **High Explosive** (G113), foaled 1915, bred by J. Blakelock, Falinge Pony Stud, Rochdale; s Southwell Swell (12164), d Hollin Glow Worm (22616), s d Torchfire (9472)



**JUMPING.**

**CLASS 43.**—*Mare or Gelding, 15 hands and over, jumping over the course in the best form on the 1st day of the Show.* [14 entries.]

**I. (£10.)**—J. P. GLENCROSS, The Lodge, Battenhall, Worcester, brown horse, **Safety**.

**II. (£5.)**—CAPTAIN T. L. HORN, M.C., Cavalry School, Netheravon, Wilts, brown mare, **Shady Girl**.

**III. (£2.)**—T. SINGER, High House Farm, Corsley, brown gelding, **Jack**.

**R.**—CAVALRY SCHOOL, Netheravon, Wilts, bay gelding, **Bill**.

**CLASS 44.**—*Mare or Gelding, under 15 hands, jumping over the course in the best form on the 1st day of the Show.* [1 entry.]

**I. (£10.)**—MRS. J. P. GLENCROSS, The Lodge, Battenhall, Worcester, bay gelding, **Ormond Boy**.

**CLASS 45.**—*Mare or Gelding, 15.3 hands and over, jumping over the course in the best form on the 2nd day of the Show.* [8 entries.]

**I. (£10.)**—T. GLENCROSS, The Paddocks, Stoke Gifford, Bristol, bay gelding, **Monarch**.

**II. (£5.)**—J. P. GLENCROSS, The Lodge, Battenhall, Worcester, brown horse, **Safety**.

**III. (£2.)**—CAVALRY SCHOOL, Netheravon, Wilts, bay gelding, **Bill**.

**R.**—CAVALRY SCHOOL, bay gelding, **Bronco**.

**CLASS 46.**—*Mare or Gelding, under 15.3 hands, jumping over the course in the best form on the 2nd day of the Show.* [9 entries.]

**I. (£10.)**—T. GLENCROSS, The Paddocks, Stoke Gifford, Bristol, bay gelding, **Tradesman**.

**II. (£5.)**—MRS. J. P. GLENCROSS, The Lodge, Battenhall, Worcester, bay gelding, **Ormond Boy**.

**III. (£2.)**—MAJOR E. M. DORMAN, 4th Dragoon Guards, Mooltan Barracks, Tidworth, chestnut mare, **Mare**, foaled 1908.

**R.**—MISS O. WYNDHAM, Clouds, East Knoyle, Salisbury, bay mare, **Saintly Maude**, foaled 1912.

**CLASS 232.**—*Officers' Jumping Class, on the 3rd day of the Show* [28 entries.]

**I.**—CAVALRY SCHOOL, Netheravon, **Bronco**.

**II.**—MAJOR DORMAN, D.S.O., M.C., 4th Dragoon Guards, Mooltan Barracks, Tidworth, chestnut mare, **Tennis Ball**.

**R.**—CAVALRY SCHOOL, **Bill**.

**CLASS 47.**—*Mare or Gelding, 15 hands and over, jumping over the course in the best form on the 3rd day of the Show.* [17 entries.]

**I. (£10.)**—CAVALRY SCHOOL, Netheravon, Wilts, bay gelding, **Bronco**.

**II. (£5.)**—LIEUT.-COL. A. G. LITTLE, D.S.O., Cavalry School, Netheravon, Wilts, brown gelding, **Pongo**.

**III. (£2.)**—T. GLENCROSS, The Paddocks, Stoke Gifford, Bristol, bay gelding, **Monarch**.

**CLASS 48.**—*Mare or Gelding, under 15 hands, jumping over the course in the best form on the 3rd day of the Show.* [1 entry.]

**II. (£5.)**—MRS. J. P. GLENCROSS, The Lodge, Battenhall, Worcester, bay gelding, **Ormond Boy**.

**CLASS 49.**—*Mare or Gelding, jumping highest on the 4th day of the Show.* [5 entries.]

**Equal I. (£5.)**—F. GOLDSMITH, Petersfield, Hants, chestnut mare, **Ozone**, aged.

**Equal I. (£5.)**—LIEUT.-COLONEL A. C. LITTLE, D.S.O., Cavalry School, Netheravon, Wilts, bay mare, **Patience**.

**Equal I. (£5.)**—T. SINGER, High House Farm, Corsley, brown gelding, **Jack**.

**R.**—MISS V. MERRETT, The Green Farm, Hardwicke, Glos., roan gelding, **U.S.A.**

**CLASS 50.**—*Mare or Gelding, any height, jumping over the course in the best form on the 4th day of the Show.* [14 entries.]

**I. (£10.)**—T. SINGER, High House Farm, Corsley, brown gelding, **Jack**.

**II. (£5.)**—F. GOLDSMITH, Petersfield, Hants, chestnut mare, **Ozone**, aged.

**III. (£2.)**—MISS V. MERRETT, The Green Farm, Hardwicke, Glos., roan gelding, **U.S.A.**

**R.**—LIEUT.-COL. A. C. LITTLE, D.S.O., Cavalry School, Netheravon, Wilts, bay mare, **Patience**.

**CLASS 51.**—*Mare or Gelding, jumping highest on the 5th day of the Show.* [3 entries.]

**Equal I. (£7 10s.)**—F. GOLDSMITH, Petersfield, Hants, chestnut mare, **Ozone**, aged.

**Equal I. (£7 10s.)**—T. SINGER, High House Farm, Corsley, brown gelding, **Jack**.

**III. (£2.)**—MISS V. MERRETT, The Green Farm, Hardwicke, Glos., roan gelding, **U.S.A.**

## CHAMPION CLASS.

**CLASS 52.**—*Mare or Gelding, any height, having won a Prize in Classes 43 to 51, jumping over the course in the best form on the 5th day of the Show.* [10 entries.]

(In this Class the whole of the Jumps were raised at the discretion of the Stewards.)

**I. (£15.)**—F. GOLDSMITH, Petersfield, Hants, chestnut mare, **Ozone**, aged.

**II. (£5.)**—T. SINGER, High House Farm, Corsley, brown gelding, **Jack**.

**R.**—Miss V. MERRETT, The Green Farm, Hardwicke, Glos., roan gelding.  
**U.S.A.**

## CATTLE.

### DEVON.

(The First Prize in Class 53 and the Prizes in Class 54 were given by the Devon Cattle Breeders' Society).

**CLASS 53.**—*Devon Cow in-Milk, calved before 1917.* [4 entries.]

**I. (£10.)**—A. POPE, Henstill, Sandford, Crediton, Devon, **Sandford Duchess 16th** (27825), born 10th June, 1914; s Royal Red (6904), d Sandford Duchess, 4th (20889), s d Bickham Boy 3rd (4531).

**II. (£5.)**—C. MORRIS, Highfield Hall, St. Albans, **Highfield Darkie 5th** (28570), born 6th August, 1915; s Holcombe Reminder (7413), d Darkie 5th (23716), s d Combe Lord (5461).

**III. (£2.)**—W. G. BUSK, J.P., Wraxall Manor, Rampisham, Dorchester, **Wynford Daisy 2nd** (B349), born 5th December, 1909, bred by J. H. Chick, Wynford Eagle, Maiden Newton, Dorset; s Compton George (6011), d Wynford Daisy (A84).

**CLASS 54.**—*Devon Cow or Heifer, in-Milk, milked in the Ring before judging, under Conditions No. 61:* [4 entries.]

**I. (£10.)**—W. D. CHICK, Compton Valence, Frampton, Dorchester, **Compton Glitter 3rd** (30838), born 13th December, 1914; s Compton Doctor (7985), d Compton Glitter 2nd, s d Wyndthorpe Woodrough (6599).

**II. (£5.)**—W. D. CHICK, **Compton Harp**, born 16th February, 1913; s Charmer (6642), d Happy, s d Overton Eclipse (5078).

**CLASS 55.**—*Devon Heifer, in-Milk, calved in 1917. First prize, £10—second, £5—third, £2.*

[No ENTRY.]

**CLASS 56.—*Devon Heifer, calved in 1918.* [2 entries.]**

**I. (#10.)**—C. MORRIS, Highfield Hall, St. Albans, **Highfield Dizzy** (31250), born 26th March; s Woodland's Goldsmith (9528), d Dorset Dizzy (26910), s d Wyndthorpe Woodrough (6599).

**II. (#5.)**—A. POPE, Henstill, Sandford, Crediton, Devon, **Sandford Curly 8th**, born 18th January; s Barum Duke (8355), d Sandford Curly (20888), s d Bickham Boy 3rd (4531).

**CLASS 57.—*Devon Heifer, calved in 1919.* [4 entries.]**

**I. (#10.)**—BANKES SETTLED ESTATES, Kingston Lacy, Wimborne, **Kingston Lacy Lorna**, born 24th April; s Pound Herald (9426), d Nugent (27200), s d Dog Fox (5752).

**II. (#5.)**—C. MORRIS, Highfield Hall, St. Albans, **Highfield Hetty** (Vol. xliii), born 3rd January; s Highfield Gem 2nd (9329), d Pound Hetty 3rd (29561), s d Dairyman (7040).

**III. (#2.)**—J. H. CHICK, Wynford Eagle, Dorchester, Dorset, **Wynford Miss Label** (Vol. liii), born 8th June; s Tumbler Secundus (9490), d Wynford Label (26522), s d Compton Rattler (6309).

**CLASS 58.—*Devon Bull, calved in 1916 or 1917.* [4 entries.]**

**I. (#10.)**—C. MORRIS, Highfield Hall, St. Albans, **Highfield Gem 2nd**, (9329), born 6th March, 1916; s Highfield Victor (7146), d Handsome 2nd (26175), s d Capton Beano (6285).

**II. (#5.)**—HIS MAJESTY THE KING, The Royal Farms, Windsor, **Windsor Famous** (9522), born 27th January, 1916; s Windsor Captain (8325), d Cothelstone Fallacy (24294), s d Macaroon (5856).

**III. (#2.)**—W. D. CHICK, Compton Valence, Frampton, Dorchester, **Roadwater Dreadnought**, born 6th January, 1917, bred by A. J. Hill, Roadwater, Washford, Taunton, Somerset; s Lovely's Duke 6th (8965), d Dewdrop 21st (25131), s d Stockleigh Giant (5913).

**CLASS 59.—*Devon Bull, calved in 1918.* [1 entry.]**

**I. (#10.)**—C. MORRIS, Highfield Hall, St. Albans, **Heatherton Pilot** (10102), born 20th February, bred by J. A. and M. A. Beedell, Heatherton, Bradford, Taunton; s Gotton Prince 6th (9301), d Heatherton Gentle 49th (28064), s d Durston Pilot (6699).

**CLASS 60.—*Devon Bull, calved in 1919.* [4 entries.]**

**I. (#10.)**—H.R.H. THE PRINCE OF WALES, K.G., The Duchy Home Farm, Stoke Clemsland, Cornwall, **Coombeshead Senator**, born 9th February; s Clampit Gay Laddie (9197), d Daisy 37th (25036), s d Stockleigh Magnum Bonum (6217).

**II. (25.)**—C. MORRIS, Highfield Hall, St. Albans, **Bickley Fairfax** (Vol. xliii), born 9th February, bred by S. Kidner, Bickley, Milverton, Somerset; s Highfield Gem 3rd (9690), d Goldfinder Stuckey (25942), s d Stockleigh Goldfinder (7268).

**III. (22.)**—A. POPE, Henstill, Sandford, Crediton, Devon. **Sandford Dairyman** (Vol. xliii), born 12th June; s Barum Duke (8355), d Sandford Curly 3rd (26150), s d Royal Red (6904).

### CHAMPION PRIZE.

GIVEN BY THE DEVON CATTLE BREEDERS' SOCIETY.

*Best Animal exhibited in Classes 53 to 60.*

**I. (210.)**—C. MORRIS, Highfield Hall, St. Albans, **Heatherton Pilot** (10102), born 20th February, bred by J. A. and M. A. Beedell, Heatherton, Bradford, Taunton; s Gotton Prince 6th (9301), d Heatherton Gentle 49th (28064), s d Durston Pilot (6699).

**R. BANKES SETTLED ESTATES, Kingston Lacy, Wimborne, Kingston Lacy Lorna**, born 24th April; s Pound Herald (9426), d Nugent (27200), s d Dog Fox (5752).

### SOUTH DEVON.

(The Prizes in Class 61 were given by the South Devon Herd Book Society).

CLASS 61.—*South Devon Cow, in-Milk, calved before 1917.*  
[8 entries.]

**I. (210.)**—D. CAMP & SONS, Widland, Modbury, South Devon, **Buttercup 5th** (11777), born 27th September, 1912, bred by T. W. Luscombe, Englebourne, Totnes, Devon; s Rew Rentpayer (3548), d Buttercup 6th (7886), s d Yam Yam (2052).

**II. (25.)**—R. AND H. CHAFFE, Worswell Barton, Revelstoke, near Plymouth, **Worswell Phyllis**, born 29th November, 1914; s Pamflete Dairyman (4509), d Worswell Primrose Girl (11383).

CLASS 62.—*South Devon Cow or Heifer, in-Milk, calved in 1917.*  
[1 entry.]

**I. (210.)**—A. SOPER & SONS, Gerston Farm, Totnes, **Julia 10th** (18952), born 20th July; s Molenick Monarch (4979), d Julia 5th (13270), s d Happy Boy (3167).

CLASS 63.—*South Devon Heifer, calved in 1918.* [3 entries.]

**I. (210.)**—THE RIGHT HON. COL. F. B. MILDMAY, M.P., Flete, Ivybridge, **Lilian's Favourite** (20112), born 14th September; s Warrior (6299), d Lilian (10164), s d Henry 8th (3179).

**II. (25.)**—R. SKINNER, Stretchford, Buckfastleigh, Devon, **Alice** (20507), born 14th May; s Molenick Monarch (4979), d Careless (15964), s d Well Bred (4647).

**III. (22.)**—R. SKINNER, **Purdy** (20515), born 25th March; s Molenick Monarch (4979), d Prettyface (14547), s d Well Bred (4647).

**CLASS 64.—*South Devon Heifer, calved in 1919.* [5 entries.]**

**I. (£10.)**—R. AND H. CHAFFE, Worswell Barton, Revelstoke, near Plymouth, **Worswell Gladys 11th**, born 2nd July; s Widland Champion (6874), d Worswell Gladys 4th (13663).

**II. (£5.)**—THE RIGHT HON. COL. F. B. MILDMA, M.P., Flete, Ivybridge, **Lilly 10th**, born 11th January; s Lilian's Champion (6016), d Lilly 5th (12962), s d Butleigh Prince (3109).

**III. (£2.)**—H. SPURRIER, Stype Grange, Hungerford, Berks, **Stype Careful**, born 29th May; s John Bull (5979), d Warren Careful (15648), s d Primley Fossicker (4534).

**SPECIAL PRIZE.**

GIVEN BY CHARLES A. HANSON, ESQ., FOWEY HALL, CORNWALL,  
ALDERMAN OF THE CITY OF LONDON.

*A Challenge Cup for the Best Cow in-Milk, in the South Devon Classes, to be won three times in succession or four times altogether, before becoming the property of the winner.*

**I.**—D. CAMP & SONS, Widland, Modbury, South Devon, **Buttercup 5th** (11777), born 27th September, 1912, bred by T. W. Luscombe, Englebourne, Totnes, Devon; s Rew Rentpayer (3548), d Buttercup 6th (7886), s d Yam Yam (2052).

**R.**—R. AND H. CHAFFE, Worswell Barton, Revelstoke, near Plymouth, **Worswell Phyllis**, born 29th November, 1914; s Pamflete Dairyman (4509), d Worswell Primrose Girl (11383).

**CLASS 65.—*South Devon Bull, calved in 1916 or 1917.* [4 entries.]**

**I. (£10.)**—W. T. HENDY & SON, Carsewell, Holbeton, near Plymouth, **Lilian's Pride** (6605), born 3rd January, 1916, bred by Col. F. B. Mildmay, Flete, Ivybridge; s Bickham Beauty (4280), d Lilian (10164), s d Henry 8th.

**II. (£5.)**—W. L. HOSKING & SONS, Fentongollan, Probus, Cornwall, **Stretchford Masterpiece** (6793), born 26th January, 1916, bred by A. Sloper, Gerston, Totnes; s Molenick Monarch (4979), d Maryllia 4th (11125), s d Happy Boy (3167).

**III. (£2.)**—M. WROTH, Coombe, Holbeton, Plymouth, **Mothecombe Milkman**, born 29th January, 1917; s Brownstone Laddie (4774), d Kitty (11346), s d Merafield Paymaster (3491).

**CLASS 66.—*South Devon Bull, calved in 1918.* [3 entries.]**

**I. (£10.)**—J. C. P. HARVEY, Pamflete, Holbeton, near Plymouth, **Coleridge Napoleon 4th**, born 3rd June, bred by R. Sawtell, Prawle, Kingsbridge; s Napoleon 12th (6658), d Champion (14498).

**II. (25.)**—A. N. BOON, Milton, Dartmouth, **Milton Challenger** (7910), born 20th May; s Lilian's Pride (6605), d Pretty (11845), s d Spriddlescombe Challenger (3582).

**III. (22.)**—H. SPURRIER, Stype Grange, Hungerford, Berks, **Bow Well Bred**, born 23rd March, bred by — Harris, Well, Stoke Gabriel; s Tidwell Champion (6229), d Pretty Face 5th (10002), s d Golden Fancy (2894).

**CLASS 67.**—*South Devon Bull, calved in 1919.* [3 entries.]

**I. (210.)**—THE RIGHT HON. COL. F. B. MILDMAI, M.P., Flete, Ivybridge, **Lilly's Champion**, born 13th January; s Warrior (6299), d Lilly 7th (15591), s d Bickham Beauty (4280).

**II. (25.)**—B. LUSCOMBE, Bowden, Yealmpton, **Bowden Shinner**, born 10th March; s Lilian's Champion (6016), d Duchess (13237).

**III. (22.)**—B. LUSCOMBE, **Bowden Countess King**, born 18th February; s. Bowden Cherry King (4318), d Countess (11032).

## SHORTHORN.

(The First Prizes in Classes 68 and 69 (and a Silver Medal to the Breeder of the winners) were given by the Shorthorn Society, and the First Prize in Class 77 by the Dairy Shorthorn Association.)

**CLASS 68.**—*Pedigree Shorthorn Dairy Cow, in-Milk, calved in or before 1916, eligible for, and entered in Coates's Herd Book, or pedigree sent for such entry previous to the Show, and not having previously won a similar prize offered by the above-named Society or Association in 1920, to be milked in the Ring before judging, under Conditions 61.* [8 entries.]

**I. (210.)**—OLYMPIA AGRICULTURAL CO., LTD., Offchurch, Leamington, red, **Iford Princess Gwynne 2nd**, born 11th March, 1911, bred by J. and H. Robinson, Iford, Lewes, Sussex; s Duke of Barrington (102070), d Countess Gwynne, s d Pendennis (86805).

**II. (25.)**—MAJOR G. J. BUXTON, Tockenham Manor, Wootton Bassett, Wilts, roan, **Rosebud 14th**, born 15th May, 1916; s Batchelor's Button (118681), d Rosebud 13th, s d Drendnought (102049).

**R.**—MRS. F. W. ROBINSON, Amberley Court, Monmouth, roan, **Sweet Melody** (Vol. lxiii, p. 1120), born 22nd August, 1916; s Darlington Viceroy 2nd (119808), d Wallstown Melody, s d Wallstown Challenger (113659).

**CLASS 69.**—*Shorthorn Dairy Cow, in-Milk, calved in or after 1917, eligible for, and entered in Coates's Herd Book, or pedigree sent for such entry previous to the Show, and not having previously won a similar prize offered by the above-named Society or Association in 1920, to be milked in the Ring before judging, under Conditions 61.* [5 entries.]

**I. (210.)**—OLYMPIA AGRICULTURAL CO., LTD., Offchurch, Leamington, roan, **Daphne**, born 15th July, 1917; s Premier Gift (132760), d Doreen, s d Foundation Stone (105524).

**II. (25).—**MAJOR G. J. BUXTON, Tockenham Manor, Wootton Bassett, Wilts, roan, **Tockenham Misselthrush**, born 20th May, 1918; s Oxford Don (127216), d Misselthrush, s d Ranger (103487).

**R.—**MRS. F. W. ROBINSON, Amberley Court, Monmouth, light roan, **Oxslip** (Vol. lxiv), born 25th September, 1917; s Darlington Viceroy 2nd (119808), d Derry Dido 36th, s d Cherry Bud (111281).

**CLASS 70.—Shorthorn Cow, in-Milk, calved before 1917.** [7 entries.]

**I. (210).—**W. M. CAZALET, Fairlawne, Tonbridge, roan, **Balnakyle Augusta 2nd**, born 20th December, 1916, bred by J. Cameron, Balnakyle, Munloch; s Ossian of Cluny (121904), d Balnakyle Augusta (Vol. lxi, p. 648), s d Collynie Golden Stamp.

**II. (5).—**S. F. EDGE, Gallops Homestead, Ditchling, Sussex, rich roan, **Vahan Victress** (Vol. lxii, p. 776), born 9th January, 1915; s Collynie Regal Lavender (114770), d Victress 9th (Vol. lx, p. 655), s d Pride of Clippers (106538).

**III. (22).—**THE HON. MRS. BRUCE WARD, Godington, Ashford, Kent, dark roan, **Bilsington Lady Travers 16th** (Vol. lxi, p. 595), born 27th January, 1914, bred by R. J. Balston, Bilsington Priory, Ashford, Kent; s Edcote Falcon (111674), d Lady Tarves 12th (Vol. lii), s d Newton Jupiter (96200).

**R.—**MAJOR H. C. C. BATTEN, D.S.O., Ryne Intrinseca, Yetminster, Dorset, roan, **Perrott Cowslip**, born 1911, bred by B. R. Broughton, Manor Farm, North Perrott, Somerset; s Coker Imperial (14187 C.H.B.).

**CLASS 71.—Shorthorn Heifer, in-Milk, calved in 1917.** *First prize, £10—second, £5—third, £2.*

[NO ENTRY.]

**CLASS 72.—Shorthorn Heifer, calved in 1918.** [6 entries.]

**I. (210).—**MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, Berks, dark roan, **Basildon Augusta 3rd**, born 8th July; s Ardlethan Savant (134672), d Basildon Augusta (Vol. lxiv, p. 1131), s d Windsor Lad (113735).

**II. (25).—**MAJOR J. A. MORRISON, D.S.O., light roan, **Basildon Beauty Groat**, born 1st May; s Ardlethan Savant (134672), d Basildon Groat (Vol. lxiii., p. 1029), s d Edgescote Poet (115278).

**III. (22).—**W. M. CAZALET, Fairlawne, Tonbridge, roan, **Notlaw Nonpareil 32nd**, born 24th October, bred by Dr. Vaughan Horley, Walton Hall, Bletchley; s Hean Cumberland (131412), d Notlaw Nonpareil 19th (Vol. lxii, p. 839), s d Edgescote Great Chief (115628).

**R.—**B. R. BROUGHTON, Manor Farm, North Perrott, Crewkerne, red, **Perrott Cowslip 3rd**, born 7th January; s Rearguard (130276), d Perrott Cowslip (637), s d Coker Imperial (141687).

**CLASS 73.—Shorthorn Heifer, calved in 1919.** [9 entries.]

**I. (210).—**W. M. CAZALET, Fairlawne, Tonbridge, roan, **Princess Royal Cicely**, born 3rd February, bred by Sir H. Leon, Bletchley Park, Bletchley, Bucks; s Edgescote White Eagle (115284), d Princess Royal Betty (Vol. lix, p. 820), s d Coming Storm (108242).



**II. (25.)**—THE HON. MRS. BRUCE WARD, Godington, Ashford, Kent, roan, **Dewlap 14th**, born 5th March, bred by the Exors. of R. J. Balston, Bilsington Priory, Ashford, Kent; s Bilsington Vanguard (129670), d Dewlap 3rd (Vol. lviii), s d Tehidy Robin Hood (97420).

**III. (22.)**—THE HON. MRS. BRUCE WARD, white, **Bilsington Rosebud 11th**, born 12th January, bred by Exors. of R. J. Balston, Bilsington Priory, Ashford, Kent; s Dewlap's Royal Sovereign (125170), d Bilsington Rosebud 7th (Vol. lxii), s d Bilsington Archer.

**R.**—EXORS. OF THE LATE W. E. PAIN, East Stratton, Micheldever Station, Hants, roan, **Marsh Marigold**, born 24th April; s Windsor Elector (140197), d Cotehay Marigold 2nd, s d Bletchley Vizier (104822).

**H.C.**—S. F. EDGE, Gallop's Homestead, Ditchling, Sussex, roan, **Vahan Beauty 3rd**, born 26th April; s Vahan Royal Stamp (146071), d Vahan Beauty 2nd, s d Edgecote Chancellor (120077).

**C.**—HIS MAJESTY THE KING, The Royal Farms, Windsor, red and little white, **Windsor Lady**, born 19th January; s Rubicon (145191), d Windsor Gay Rose, s d Cowslip King (105146).

**CLASS 74.**—*Shorthorn Bull, calved in 1916 or 1917.* [7 entries.]

**I. (210.)**—THE HON. MRS. BRUCE WARD, Godington, Ashford, Kent, dark roan, **Bilsington Imperator**, born 4th October, 1917, bred by the Exors. of R. J. Balston, Bilsington Priory, Ashford, Kent; s Dewlap's Royal Sovereign (125170), d Bilsington Rosemary 2nd (Vol. lix), s d Golden Cloud (108750).

**II. (25.)**—C. E. GUNTHER, Tongswood, Hawkhurst, Kent, red and little white, **Tongswood Bassoon** (145942), born 9th May, 1917; s Tongswood Clarion (133960), d Tongswood Bessie 3rd, s d Knight Lavender (121046).

**III. (22.)**—J. H. D. LANGHORNE, Chapel Farm, Dorking, roan, **Marland's Tetrach**, born 26th June, 1917, bred by H. G. Latilla, Itchingfield, Horsham; s Leix Tetrach, d Edgecote Augusta, s d Diebmont Count.

**R.**—S. J. BLANCHARD, Manor Farm, Charlton Donhead, Salisbury, roan, **Charlton Chieftain**, born 8th November, 1917, bred by Reeves Bros., Cote Farm, Kilmington, Wilts; s Fonthill Chieftain 4th (125567), d Topsy, s d Pluto's Heir.

**H.C.**—A. H. CLOUGH, Castletop, Burley, Brockenhurst, roan, **Jupiter**, born 18th January, 1916; s Longhill's Aristocrat (121207), d Princess Martha, s d Prince 13th (92871).

**C.**—J. PHILIPSON, Manor Farm, Langford, near Salisbury, roan, **Wild Don**, born 28th February, 1916, bred by J. A. Attwater, Dry Leaze, Cirencester; s Dictator (125191), d Wild Maid 3rd, s d Lord Pailful (109243).

**CLASS 75.**—*Shorthorn Bull, calved in 1918.* [12 entries.]

**I. (210.)**—E. SMITH, 107, Bransford Road, Worcester, roan, **Farmhill Mariner**, born 22nd April, bred by J. B. Henderson, Farmhill, Coagh, Ireland; s Royal Mariner (139085), d Lawton Dorothy 2nd, s d Dunglass Chieftain (115188).

**II. (25.)**—H.R.H. THE PRINCE OF WALES, K.G., Home Farm, Stoke Clemsland, Cornwall, roan, **Christian King**, born 19th January; s Butterfly Knight (130029), d Adbolton Rosy Queen, s d King Christain of Denmark (86316).

**III. (22.)**—S. F. EDGE, Gallop's Homestead, Ditchling, Sussex, roan, **Vahan Monarch**, born 31st July; s Prince of the Manor (132834), d Octavia 7th (Vol. ix, p. 731), s d Ascott Emperor (118609).

**R.**—B. R. BROUGHTON, Manor Farm, North Perrott, Crewkerne, roan, **Huxham Dean**, born 2nd March, bred by J. Day, Huxham; s Signet Prince (122910), d Huxham Charmer 11th, s d Royal Pluto.

**H.C.**—A. RUSSELL-SMITH, North Houghton Manor, Stockbridge, light roan, **Marden Conqueror**, born 23rd February, bred by Sir W. Greenwell, Bart., Marden Park, near Caterham; s Marden Dane (106128), d Marden Julia 4th (Vol. lxii, p. 823), s d Pride of Sittyton (100005).

**C.**—W. S. LOCKYER, Lee Manor Farm, Romsey, roan, **Fylde Freshman 7th**, born 14th March, bred by R. Silcock & Sons, Thornton Hall, Poulton-le-Fylde; s Fylde Peer 4th (120321), d Fylde Seraphine 2nd (Vol. lviii, p. 951), s d Babraham Bridegroom (94088).

**CLASS 76.**—*Shorthorn Bull, calved in 1919.* [11 entries.]

**I. (210.)**—HIS MAJESTY THE KING, The Royal Farms, Windsor, light roan, **Windsor Matchless**, born 28th February; s Windsor Archie (140189), d Matilda 3rd, s d Golden Treasure (95346).

**II. (25.)**—H.R.H. THE PRINCE OF WALES, K.G., Home Farm, Stoke Clemsland, Cornwall, dark roan, **Oberon**, born 21st April; s Whiteford Magnet (146333), d Fairy Queen 26th, s d Sky Pilot (110213).

**III. (22.)**—C. E. GUNTHER, Tongwood, Hawkhurst, Kent, white, **Tongwood Bequest**, born 17th March; s Knight Lavender (121046), d Tongwood Bessie 3rd, s d Knight Lavender (121046).

**R.**—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, Berks, roan, **Basildon Premier**, born 10th January; s Ardlethan Savant (134672), d Basildon Phantom (Vol. lxiii, p. 1029), s d Edgercote Poet (115278).

**H.C.**—D. COMBES, Jun., Dinton Manor, Salisbury, white, **Lord Roland**, born 1st February, bred by R. Adams, Long Ashton, Bristol; s Kingthorpe Dreadnought (137391), d Lady Sophie 2nd (Vol. lviii, p. 854), s d Pride of Gainford.

**CLASS 77.**—*Pedigree Shorthorn Dairy Bull, calved in 1919, subject to Conditions No. 62.* [6 entries.]

**I. (210.)**—MAJOR G. J. BUXTON, Tockenham Manor, Wootton Bassett, Wilts, red roan, **Tockenham Minstrel 3rd**, born 10th April; s Kelmscott Acrobat 4th, d Songstress, s d Lord Pailful (109243).

**II. (25.)**—MAJOR G. J. BUXTON, red, **Tockenham Minstrel 2nd**, born 12th January; s Kelmscott Acrobat 4th, d Leazon Musical, s d Puddington Minstrel (100110).

**H.C.**—OLYMPIA AGRICULTURAL CO., LTD., Offchurch, Leamington, red, **Team Royal Gwynne**, born 14th January; s Premier Gift (132760), d Iford Princess Gwynne 2nd, s d Duke of Barrington (102070).

**C.**—R. FORTUNE, Newhouse, Cranleigh, Surrey, white, **Newhouse Snow King**, born 31st January; s Puddington King of Hearts 3rd (127509), d Rossall Golden Duchess 3rd (Vol. lxiii, p. 742), s d Golden Fortune (120449).

## CHAMPION PRIZE.

GIVEN BY THE SHORTHORN SOCIETY.

*Best Bull in Classes 74 to 77, entered in, or eligible for entry in Coates's Herd Book.*

**I. (210.)**—**HIS MAJESTY THE KING**, The Royal Farms, Windsor, light roan, **Windsor Matchless**, born 28th February; s Windsor Archie (140189), d Matilda 3rd, s d Golden Treasure (95346).

**R.**—**THE HON. MRS. BRUCE WARD**, Godington, Ashford, Kent, dark roan, **Bilsington Imperator**, born 4th October, 1917, bred by the Exors. of R. J. Balston, Bilsington Priory, Ashford, Kent; s Dewlap's Royal Sovereign (125170), d Bilsington Rosemary 2nd (Vol. lix), s d Golden Cloud (108750).

## HEREFORD.

(The Prizes in Class 85 and the Champion Prizes were given by the Hereford Herd Book Society).

**CLASS 78.**—*Hereford Cow, in-Milk, calved before 1917.* [1 entry.]

**I. (210.)**—**W. J. S. WHITE**, Zeals, Wiltshire, born 15th March, 1914; s Vern Lictor (30164), d Quadrille, s d Eaton Garnet (26085).

**CLASS 79.**—*Hereford Heifer, in-Milk, calved in 1917.* [1 entry.]

**I. (210.)**—**O. WILLIAMS**, Crossways, Cowbridge, Glam., **Holly Nancy**, born 2nd January, bred by J. Jones, Hollybush Farm, Cowbridge, Glam.; s Remus (31913), d Nancy, s d Aaron (25084).

**CLASS 80.**—*Hereford Heifer, calved in 1918.* [3 entries.]

**I. (210.)**—**W. H. D. DAVIES**, Pigeon House, Weston Beggard, **Miss Miriam**, born 17th March; s Mansel Middy, d Fairtrade, s d Obelisk (21637).

**II. (25.)**—**T. L. WALKER**, The Cedars, Broadwas-on-Teme, Worcester, **Cynthia**, born 1st January; s Shraden Wizard (28718), d Cymbol, s d Conqueror (29007).

**III. (22.)**—**T. L. WALKER**, **Dove**, born 2nd January; s Shraden Wizard (28718), d Ringdove, s d Samson (24269).

**CLASS 81.**—*Hereford Heifer, calved in 1919.* [4 entries.]

**I. (210.)**—**G. A. DENNY**, Byford Court, Hereford, born 5th January; s Anchor (32185), d Eleanor (46447), s d Gainsborough (28303).

**II. (25.)**—**O. WILLIAMS**, Crossways, Cowbridge, Glamorgan, **Crossways Opal**, born 6th January; s Ringer (31920), d Sheepecote Opal, s d Milton (25571).

**III. (22.)**—**CAPTAIN R. T. HINCKES**, Mansel Court, Mansel Lacy, Hereford, **Mansel Bertha 5th**, born 4th January; s Starlight (28754), d Bertha (Vol. xlv, p. 628), s d Eaton Pearl (26830).

**CHAMPION PRIZE.***Best registered Cow or Heifer in Classes 78 to 81.*

**I. (#10.)**—G. A. DENNY, Byford Court, Hereford, born 5th January; s Anchor (32185), d Eleanor (46447), s d Gainsborough (28303).

**R.**—O. WILLIAMS, Crossways, Cowbridge, Glamorgan, **Crossways Opal**, born 6th January; s Ringer (31920), d Sheepcote Opal, s d Milton (25571).

**CLASS 82.**—*Hereford Bull, calved in 1916 or 1917* [1 entry.]

**I. (#10.)**—J. EDWARDS, Broadward, Leominster, **Broadward Renumerator**, born 2nd February, 1917; s Christmas Gift, d Broadward Lucilla, s d Broadward Ensign.

**CLASS 83.**—*Hereford Bull, calved in 1918.* [8 entries.]

**I. (#10.)**—O. WILLIAMS, Crossways, Cowbridge, Glam., **Bounteous**, born 2nd February, bred by the late Lord Rhondda, Llanwern Park, Newport, Mon.; s Sir Sam (33131), d Bountiful, s d Charity (28990).

**II. (#5.)**—C. T. PULLEY, M.P., Lower Eaton, Hereford, **Eaton Jasper** (Vol. 1), born 11th January; s Eaton Eclipse (32479), d Clandine 2nd, s d Eaton Masterpiece (25315).

**III. (#2.)**—J. WALKER, Knightwick Manor, Worcester, **Twyford Garnet**, born 1st February, bred by S. C. Hayter, Twyford, Pembridge; s Ringer (31920), d Dorothea, s d Christmas Gift (25882).

**R.**—HIS MAJESTY THE KING, The Royal Farms, Windsor, **Sir Edward** (38056), born 30th January; s Paymaster (32892), d Sunray, s d Broadward Royalty (28955).

**V.H.C.**—W. H. D. DAVIES, Pigeon House, Weston Beggard, **Shucknall Starlight**, born 24th February, bred by H. Moore, Shucknall, Hereford; s Mansell Handyman (33954), d Gaylass (Vol. xlvii, p. 791), s d Shucknall Victor (29383).

**H.C.**—SIR J. R. G. COTTERELL, BART., Garnons, Hereford, **Minstrel**, born 22nd January; s Saladin (31957), d Musette, s d Administrator (27298).

**H.C.**—J. TUDGE, Duxmoor, Craven Arms, Salop, **Uncle Ben**, born 2nd April, bred by B. Rogers, The Willows, Ludlow, Salop; s Lion (30728), d Sunbeam, s d Chance (28985).

**C.**—T. L. WALKER, The Cedars, Broadwas-on-Teme, Worcester, **Eric**, born 16th February; s Shraden Wizard (28718), d Erica, s d Lord Lieutenant (22323).

**CLASS 84.**—*Hereford Bull, calved in January or February, 1919.* [4 entries.]

**I. (#10.)**—CAPTAIN R. T. HINCKES, Mansel Court, Mansel Lacey, Hereford, **Mansel Banner Rex**, born 20th January; s Turgot (34413), d Lady Rougemont 4th (Vol. xlviii, p. 680), s d Starlight.

**II. (25.)**—SIR J. R. G. COTTERELL, BART., Garnons, Hereford, **Buccaneer**, born 7th February ; s Saladin (31957), d Brownie, s d Royal Ringer (26458).

**III. (22.)**—CAPTAIN R. T. HINCKES, **Bodenham Geyser** (36036), born 10th January, bred by Mrs. E. Medlicott, Court Farm, Bodenham, Hereford ; s Eaton Gambler, d Lucy 5th (Vol. I), s d Broadward Major (31302).

**R.**—CAPTAIN R. T. HINCKES, **Mansel Banner Guard**, born 9th January : s Turgot (34413), d Gem (44517), s d Rougemont (20296).

**CLASS 85.**—*Hereford Bull, calved on or after March 1st, 1919.*  
[4 entries.]

**I. (210.)**—J. WALKER, Knightwick Manor, Worcester, **Knightwick Pioneer**, born 2nd March ; s Peacemaker (35397), d Pimpernel, s d Royal Prince (27847),

**II. (25.)**—SIR J. R. G. COTTERELL, BART., Garnons, Hereford, **Burgundy**, born 16th March ; s Saladin (31957), d Barmaid 5th, s d Royal Ringer (26458).

**III. (22.)**—O. WILLIAMS, Crossways, Cowbridge, Glam., **Crossways Hampton**, born 9th March : s Ringer (31920), d Darling, s d Christmas Gift (25882).

### CHAMPION PRIZE.

*Best registered Bull in Classes 82 to 85.*

**I. (210.)**—O. WILLIAMS, Crossways, Cowbridge, Glam., **Bounteous**, born 2nd February, bred by the late Lord Rhondda, Llanwrn Park, Newport, Mon. ; s Sir Sam (33131), d Bountiful, s d Charity (28990).

**R.**—J. EDWARDS, Broadward, Leominster, **Broadward Renumerator**, born 2nd February, 1917 ; s Christmas Gift, d Broadward Lucilla, s d Broadward Ensign.

### GLoucestershire.

(The Prizes in Classes 86 and 87 were given by the Gloucestershire Cattle Society).

**CLASS 86.**—*Gloucestershire Cow or Heifer, in-Calf to a Gloucestershire Bull.* [2 entries.]

**I. (25.)**—THE DUKE OF BEAUFORT, Badminton, dark brown, **Badminton Star**, born 10th April, 1912.

**II. (22 10s.)**—THE DUKE OF BEAUFORT, dark brown, **Badminton Perfect**, born 8th January, 1918 ; s Jack, d Cherry.

**CLASS 87.**—*Gloucestershire Bull, calved before 1920.* [2 entries.]

**I. (25.)**—M. H. GAZZARD, Panthurst Farm, Sanigar, Berkeley, black, white tail, **Severn Valesman**, born 6th April, 1918, bred by the Duke of Beaufort, Badminton.

**II. (22 10s.)**—LADY S. HICKS BEACH, Coln St. Aldwyn, Fairford, Glos., **Severn Duke** (102), born 13th August, 1918, bred by the Duke of Beaufort, Badminton, Glos.

## SUSSEX.

CLASS 88.—*Sussex Cow or Heifer, in-Milk, calved in or before 1917.*  
[2 entries.]

I. (210).—G. T. EATON, Thurston Hall, Framfield, Sussex, **Browning's Stonesdown 1st** (16290), born 12th April, 1915, bred by J. Groves, Browning's Manor, Blackboys, Sussex; s The Beau (2546), d Tutsham Stonesdown 6th (13967), s d Tutsham Beagle (2829).

II. (25).—E. E. BRABY, Drungewick Manor House, Rudgwick, Sussex, **Drungewick Pet 7th** (16127), born 27th February, 1915; s Drungewick Marksman 3rd (3274), d Drungewick Pet 3rd (12846), s d Lord of Drungewick 5th (2038).

CLASS 89.—*Sussex Heifer, calved in 1918 or 1919.* [1 entry.]

I. (210).—E. E. BRABY, Drungewick Manor House, Rudgwick, Sussex, **Drungewick Mayflower 7th** (17860), born 25th February, 1918; s A One (3577), d Drungewick Mayflower 4th (16126), s d Drungewick Marksman 3rd (3274).

## CHAMPION PRIZE.

GIVEN BY THE SUSSEX HERD BOOK SOCIETY.

*A Silver Medal for the best Cow or Heifer in Class 88 or 89.*

I.—G. T. EATON, Thurston Hall, Framfield, Sussex, **Browning's Stonesdown 1st** (16290), born 12th April, 1915, bred by J. Groves, Browning's Manor, Blackboys, Sussex; s The Beau (2546), d Tutsham Stonesdown 6th (13967), s d Tutsham Beagle (2829).

CLASS 90.—*Sussex Bull, calved in 1917, 1918 or 1919.* [3 entries.]

I. (210).—G. T. EATON, Thurston Hall, Framfield, Sussex, **Browning's Miller 27th**, born 18th January, 1918, bred by J. Groves, Browning's Manor, Blackboys, Sussex; s Browning's Miller 6th (3883), d Browning's Crystal 1st (16280), s d Apsley Albert 2nd (2706).

II. (25).—E. E. BRABY, Drungewick Manor House, Rudgwick, Sussex, **Drungewick A One 7th** (4582), born 21st March, 1918; s A One (3577), d Drungewick Beauty 9th (12840), s d Prince of Drungewick 10th (2425).

III. (22).—G. R. BENNETT, Old House Farm, West Hoathly, Sussex, **Newick Bandsmen 2nd** (4785), born 9th January, 1918, bred by Rev. F. S. Sclater, Newick Park, Lewes; s Petworth Gold Dust (4170), d Musical (11405), s d Lord Eric (1990).

## CHAMPION PRIZE.

GIVEN BY THE SUSSEX HERD BOOK SOCIETY.

*A Silver Medal for the best Bull in Class 90.*

I.—G. T. EATON, Thurston Hall, Framfield, Sussex, **Browning's Miller 27th**, born 18th January, 1918, bred by J. Groves, Browning's Manor, Blackboys, Sussex; s Browning's Miller 6th (3883), d Browning's Crystal 1st (16280), s d Apsley Albert 2nd (2706).

**RED POLL.**

(£17 towards the Prizes in Classes 91 to 93 were given by the Red Poll Cattle Society.)

**CLASS 91.—Red Poll Cow or Heifer, in-Milk, calved before 1918.**  
[17 entries.]

**I. (210).—**MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, Berks, **Kettleburgh Rosie 2.D.** (24073), born 30th November, 1913, bred by H. G. Walne, Kettleburgh Hall, Wickham Market, Suffolk; s Free Trader (10029), d Kettleburgh Rosie 2nd (19870), s d Standard Bearer (9331).

**II. (25).—**THE MARCHIONESS OF GRAHAM, Easton Park, Wickham Market, Suffolk, **Charming Lass** (24484), born 13th July, 1914; s Red David (10069), d Charming Davy 12th (22036), s d Starston Emperor (9335).

**III. (22).—**THE MARCHIONESS OF GRAHAM, **Roll Call** (24788), born 16th March, 1914; s Red David (10069), d At Last (21983), s d Lionel (9711).

**R. & H.C.—**MAJOR H. COLMORE, Antwick Manor, Wantage, Berks, **Rendlesham Gentlewoman 2nd** (24236), born 16th October, 1913, bred by Exors. of A. J. Smith, Rendlesham, Suffolk; s Longford Demoniac (10205), d Rendlesham Gentlewoman (21823), s d Rendlesham Jacobite (9957).

**H.C.—**T. Brown & Son, Marham Hall, Downham, Norfolk, **Handsome Plantain P.1.** (24577), born 7th April, 1914; s Ashlyns Count (10125), d Plantain P.1. (22717), s d Acix (9878).—THE MARCHIONESS OF GRAHAM, **Grassenhall Southgate 6th** (25096), calved 26th August, 1914, bred by J. E. Hill.

**C.—**MAJOR J. G. DUGDALE, The Abbey, Cirencester, **Manor Hyacinth** (25251), born 24th July, 1914, bred by the Countess of Stradbroke, Henham Hall, Suffolk; s Acacia (10385), d Shotley Sprite 10th (23270), s d Shotford Nelson (9742).—MRS. J. MORRISON, Shawford Place, Shawford, Hants, **Longford Kimino**, (25228) born 24th August, 1915, bred by the Earl of Radnor-Longford Castle, Salisbury, Wilts; s Longford King (10762), d Longford Roma (23089), s d Majolini (10054).

**CLASS 92.—Red Poll Heifer, calved in 1918.** [3 entries.]

**I. (210).—**T. BROWN & SON, Marham Hall, Downham, Norfolk, **Marham Dainty H.1.** (27127), born 2nd March; s Marham Gay Lad (10895), d Marham Daisy H.1. (25257), s d Ashlyns Count (10125).

**II. (25).—**LORD HASTINGS, Melton Constable Park, Norfolk, **Melton Muria** (27143), born 12th February; s Honingham Astrologie 2nd (10589), d Majivi (20446), s d Maji.

**III. (22).—**LORD HASTINGS, **Melton Maritana** (27139), born 10th February; s Honingham Astrologie 2nd (10589), d Melton Baroness (21730), s d Maji (9265).

**CLASS 93.—Red Poll Bull, calved in 1919.** [10 entries.]

**I. (210).—**J. P. ARKWRIGHT, Hatton, Warwick, **Hatton Fabian**, born 2nd February; s Hatton Guardian (11155), d Hatton Fable (24035), s d Acton Hussar (9881).

xxx *Prizes awarded to Red Poll and Aberdeen-Angus Cattle.*

**II. (25).—**T. BROWN & SON, Marham Hall, Downham, Norfolk, **Marham Florin**, born 17th January; s Marham Dauntless (11031), d Flutter P.3. (18046), s d Wentworth (5257).

**III. (22).—**G. D. SMITH, Strensham Court, Worcester, **Strensham Wizard**, born 19th January; s Alarum (10820), d Strensham Rosemary (25948), s d Ashlyn's Count (10125).

**R. & H.C.—**THE MARCHIONESS OF GRAHAM, Easton Park, Wickham Market, Suffolk, **Easton Autocrat**, born 12th April; s Sudbourne Albion (11064), d Charming Lass (24484), s d Red David (10069).

**C.—**MAJOR J. COURTAULD, Buxton Park, Petworth, **Knepp Ideal**, born January, bred by Lieut.-Col. Sir M. R. Burrell, Bart., C.B.E., Knepp Castle, Sussex; s Sudbourn Ken, d Ashlyn's Ida, s d Ashlyn's Duke.—MAJOR J. G. DUGDALE, The Abbey, Cirencester, **Whiteway Wychelm**, born 21st June; s Manor Elms (11034), d Manor Begonia (27097), s d Henham Dreadnought (10580).—THE MARCHIONESS OF GRAHAM, **Easton Aristocrat**, born 11th April; s Sudbourne Albion (11064), d Easton Lady Vanity (25575), s d Lysander (10610).

**ABERDEEN-ANGUS.**

(The First Prize in Class 94 was given by the English Aberdeen-Angus Cattle Association).

**CLASS 94.—Aberdeen-Angus Cow or Heifer, in-Milk, calved before 1st December, 1917. [8 entries.]**

**I. (210).—**E. A. WIGAN, Conholt Park, Andover, **Tuberoze of Conholt** (55475), born 16th December, 1913; s Baron Breslau (30146), d Tuberoze of Standen (43477), s d Elector of Benton (21814).

**II. (25).—**E. A. WIGAN, **Lady Rose of Conholt** (61430), born 11th December, 1916; s Earl Ebon of Ballindalloch (35751), d Tuberoze of Standen (43477), s d Elector of Benton (21814).

**III. (22).—**MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, Berks, **Jujube El** (59548. Vol. xlii, p. 365), born 20th May, 1915, bred by J. S. Grant, Dulmain Bridge, Inverness-shire, Scotland; s Elysee of Ballindalloch (31749), d Jujube 3rd of Ballintomb (50048), s d George Royal of Ballindalloch (30611).

**H.C.—**LORD PIRRIE, K.P., P.C., Witley Park, Godalming Surrey, **Eulima 46th** (57018), born 3rd December, 1914; s Earl Benin 2nd (31617), d Eulima 40 (53025), s d Pride Swagger (31049).

**C.—**(. T. SCOTT, Buckland Manor, Broadway, Worcestershire, **Ida's Image** (51295), born 3rd January, 1912, bred by Lord Penrhyn, Wicken Park, Stony Stratford, Buckinghamshire; s Elmston (29124), d Shanvaghey Ida 8th (44312), s d Alpha Beater (22859).

**CLASS 95.—Aberdeen-Angus Heifer, calved on or after 1st December, 1917. [1 entry.]**

**I. (210).—**A. W. B. HAWKINS, Stagenhoe Park, Welwyn, Herts, **Eva of Stagenhoe**, born 24th January, 1918; s Baron of Stagenhoe, d Eva of Byweel (51793), s d Danesfield Jester (18949).



**CLASS 96.—*Aberdeen-Angus Heifer, calved on or after 1st December, 1918. [9 entries.]***

**I. (210.)**—E. A. WIGAN, Conholt Park, Andover, **Wild Flower of Conholt**. (Vol. xlv), born 18th December, 1918 ; s Ether of Bleaton (39535), d Wild Violet of Conholt (59386), s d El Oro of Conholt (33029).

**II. (25.)**—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, Berks, **Ellen of Basildon** (65392), born 25th January, 1919 ; s Bartonias Jack of Coolcower (37206), d Era of Harviestoun (58606), s d Electric Bell (29104).

**III. (22.)**—E. A. WIGAN, **Beatrice of Conholt** (Vol. xlv), born 26th December, 1918 ; s Ether of Bleaton (39535), d Black Bess of Conholt (59372), s d Earl Ebon of Ballindalloch (35751).

**H.C.**—C. T. SCOTT, Buckland Manor, Broadway, Worcestershire, **Ida of Buckland** (65762), born 30th January, 1919 ; s Etrusian of Bleaton (41498), d Ida's Image (51295), s d Elmston (29124).

**C.**—LIEUT.-COL. M. G. E. BELL, Bourne Park, near Canterbury, **Playmate of Bourne**, born 15th December, 1918 : s Darwin 5th of Claverdon (39190), d Bourne Princess (48388), s d Hunton Boy (29385).

**CLASS 97.—*Aberdeen-Angus Bull, calved before December 1st, 1918. [3 entries.]***

**I. (210.)**—C. T. SCOTT, Buckland Manor, Broadway, Worcestershire, **Proud George** (38595), born 4th May, 1915, bred by A. T. Reid, Auchterarder House, Auchterarder ; s Romeo of Ballindalloch (29941), d Proud Grace of Eshott (46552), s d Gervase of Ballindalloch (28100).

**II. (25.)**—COL. C. W. S. WHITBURN, Addington Park, West Malling, Kent, **Eaton of Harviestoun**, born 26th January, 1918, bred by J. E. Kerr, Harviestoun Castle, Dollar, Clackmannanshire ; s Eden Edric of Dalmeney, d Erona of Harviestoun, s d Prince of the Wassail.

**III. (22.)**—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, **Idam of Basildon** (43827, Vol. xliii), born 27th March, 1918 : s Bartonias Jack of Coolcower (37206), d Ideal of Maisemore (58021, Vol. xli), s d Evercalm (33167).

**CLASS 98.—*Aberdeen-Angus Bull, calved on or after December 1st, 1918. [5 entries.]***

**I. (210.)**—C. T. SCOTT, Buckland Manor, Broadway, Worcestershire, **Proud George of Buckland** (46790), born 9th December, 1918 ; s Proud George (38595), d Elluma 3rd (42443), s d Euthalito (21896).

**II. (25.)**—LIEUT.-COL. M. G. E. BELL, Bourne Park, near Canterbury, **Editor of Bourne** (45505), born 7th January, 1919 ; s Darwin 5th of Claverdon (39190), d Effulgent 4th of Bourne (57723), s d Jock of Morlich (34704).

**III. (22.)**—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, Berks, **Black Prince of Basildon** (45114), born 12th January, 1919 : s Bartonias Jack of Coolcower (37206), d Black Peeress of Maisemore (56045), s d Idart of Maisemore (33315).

## xxxii *Prizes awarded to Aberdeen-Angus and British Friesian Cattle.*

**H.C.**—**MRS. F. COOKSON**, Chute Standen, Andover, Hants, **Paul of Standen**, born 18th December, 1919; s Earl Ebon of Ballindalloch, d Pansy 2nd of Standen, s d Elvado.

**C.**—**LORD PIRRIE**, K.P., P.C., Witley Park, Golalming, Surrey, **Juno of Achvochkie** (46187), born 12th December, 1918, bred by D. Dean, Achvochkie, Advie, Strathspey; s Eriskos of Bleaton (41431), d Joseene (58066), s d Prince Benison (36711).

### *CHAMPION PRIZES.*

GIVEN BY THE ABERDEEN-ANGUS CATTLE SOCIETY.

*A Silver Medal for the best Animal in Classes 94 to 98.*

**I.**—**C. T. SCOTT**, Buckland Manor, Broadway, Worcestershire, **Proud George** (38595), born 4th May, 1915, bred by A. T. Reid, Auchterarder House, Auchterarder; s Romeo of Ballindalloch (29941), d Proud Grace of Eshott (46552), s d Gervace of Ballindalloch (28100).

**R.**—**F. A. WIGAN**, Conholt Park, Andover, **Tuberoze of Conholt** (55475), born 16th December, 1913; s Baron Breslau (30146), d Tuberoze of Standen (43477), s d Elector of Benton (21814).

GIVEN BY THE ENGLISH ABERDEEN-ANGUS CATTLE ASSOCIATION.

*A Silver Medal for the best Animal of opposite sex to that awarded the Aberdeen-Angus Society's Medal in Classes 94 to 98.*

**I.**—**E. A. WIGAN**, Conholt Park, Andover, **Tuberoze of Conholt** (55475), born 16th December, 1913; s Baron Breslau (30146), d Tuberoze of Standen (43477), s d Elector of Benton (21814).

**R.**—**E. A. WIGAN**, **Wild Flower of Conholt** (Vol. xlv), born 18th December, 1918; s Ether of Bleaton (39535), d Wild Violet of Conholt (59386), s d El Oro of Conholt (33029).

### **BRITISH FRIESIAN.**

(£25 towards the Prizes in Classes 99 to 102 was given by the British Friesian Cattle Society.)

**CLASS 99.**—*British Friesian Cow or Heifer, any age, in-Milk.*  
[13 entries.]

**I. (28.)**—**THE "HACHE" HERD**, Muntham Court, Worthing, Sussex, and Bulstrode, Gerrard's Cross, Bucks, **Brookland's Sietske 4th** (17052), born 7th April, 1913, bred by J. J. Oostra, Mantgum, Holland; s Bertus (5935), d H. Sietske (22599).

**II. (24.)**—**A. AND J. BROWN**, Haydon Hill Farm, Aylesbury, Bucks, **Hedge's Dutch Stately** (24956), born 25th November, 1916; s Hedge's (imported) Fokke 2nd (3993), d Hedge's Stately (1916).

**III. (22.)**—**E. R. DEBENHAM**, Bladen Dairy Farms, Dorchester, **Bladen** (imported) **Neltye 3rd** (16942), born 28th March, 1913, bred by J. R. Schaap, Deersum, Holland; s Ceres (4497), d Neltye (16602 H.F.R.S.).

**B.**—G. T. EATON, Thurston Hall, Framfield, Sussex, **Kirkhill Nellie 3rd** (18274), born 11th July, 1914, bred by Dr. Sinclair, Kirkhill, Rigg, Aberdeen, Scotland; s Colton Queen's Own (97), d Kirkhill Nellie (2016).

**H.C.**—A. ALLEN, Manor House, Chesterblade, Somerset, **Fingringhoe Walnut** (21080), born 9th December, 1915, bred by T. B. Grubb, Fingringhoe, Colchester; s Moordale Victor (1809), d Lavender Walnut (2328).—CAPTAIN BENETT-STANFORD, Hatch House, Tisbury, **Melford Victory**, born 1911, bred by G. H. Westropp, Melford Place, Long Melford, Suffolk; d Melford Wasky (10456).

**CLASS 100.—British Friesian Heifer, not in-Milk, calved in 1918 or 1919. [21 entries.]**

**I. (26.)**—H. HALE, Findon, Worthing, Sussex, **Kingswood Bonni Jean** (34250), born 3rd January, 1918; s Kingswood (imported) Ynte (4047), d Kingswood Edna (18216), s d Toddington Potsdam (747).

**II. (24.)**—A. AND J. BROWN, Hedge's Farm, St. Albans, **Hedge's Sprightly Dutch Girl 2nd**, born 9th January, 1918; s Hedge's (imported) Fokke 2nd (3993), d Hedge's Sprightly (1912).

**III. (21.)**—THE "HACHE" HERD, Muntham Court, Worthing, Sussex, and Bulstrade, Gerrard's Cross, Bucks, **Clockhouse Vic Rinze**, born 26th March, 1919, bred by T. Williams, Pynesfield Manor, Bucks; s Clockhouse Vic Wouter (3691), d Clockhouse Rinze 7th (17234), s d Burniga 50 (5511 F.R.S.)

**R.**—G. H. THOMAS, Home Farm, Northdean, Hughenden, Bucks, **Colton Sunray** (32150), born 31st October, 1918, bred by H. Brown, Colton Mains, Dumfermline; s Terling (imported) Vic Bertus (4541), d Colton Sunset (6868), s d Colton Puritan (95).

**V.H.C.**—G. H. THOMAS, **Kingswood Ceres Myrtle**, born 28th January, 1919, bred by H. Hale, Findon, Worthing, Sussex; s Hedge's Second Series (6427), d Kingwood Myrtle (9294) s d Kingswood Prince.

**H.C.**—MISS A. GUEST, Yenston Farm, Templecombe, **Inwood Dutch Jolly**, born 28th June, 1919; s Rochford (imported) Johan (4399), d Inwood Dutch Doll (25110), s d Inwood Jock (2865).

**C.**—R. AND I. McROBERT, Colney Park, St. Albans, **Douneside Isla**, born 2nd January, 1919, bred by A. W. McRobert, Douneside, Tarland, Aberdeenshire; s Dunninald Gerben, d Dunninald Flirt (20852), s d Gilston Roger.—R. W. J. SUTHERLAND, Gadairwen, Croesfaen, Glamorgan, **Gadairwen Detta**, born 8th January, 1919; s Janus (imported), d Royal Hyacinth 8th (22588), s d Royal (imported) Orion (4429).

**CLASS 101.—British Friesian Bull, calved in or before 1918. [8 entries.]**

**I. (28.)**—G. T. EATON, Thursdon Hall, Framfield, Sussex, **Karel 2nd**, born 6th December, 1913, bred by R. Brandsma, Nekkum, Holland; s Karel (5264), d Jansma 5th (15138) s d Jelmer (3235).

**II. (24.)**—G. BISHOP, M.R.C.V.S., Brislington, Bristol, **Cymric Mars** (7637), born 31st August, 1917, bred by Lieut.-Col. G. R. Powell, Tynewydd, Hirwin, Glamorganshire; s Cymric (imported) Fritz, d Cymric Melba (17402), s d Melford Jester (1739).

**III. (22.)**—S. J. WRIGHT, Woodside, Quorn, **Hedge's Colton Fokke** (8025, Vol. vii), born 28th November, 1917, bred by A. and J. Brown, Hedge's Farm, St. Albans; s Hedge's (imported) Fokke 2nd (3993), d Colton Lady Mary (6844), s d Fairlight Wilhelm (139).

**R.**—R. W. J. SUTHERLAND, Gadairwen, Croesfaen, Glamorgan, **Lockland's Reputation**, born 26th September, 1918, bred by A. Smith, Lockland's, Larbert, Stirlingshire; s Cradlehall (imported) Hollander 2nd (3737), d Lochland's May (10008), s d Lochland's President (413).

**V.H.C.**—DR. WILSON, Hill Manor, Hinton Parva, Swindon, **Kingswood Marquis** (10031), born 30th January, 1918, bred by H. Hale, Kingswood, Findon, Sussex; s Kingswood (imported) Ynte (4947), d Kingswood Duchess (1986).

**C.**—A. AND J. BROWN, Haydon House, Aylesbury, **Hayden Dutch King**, born 27th September, 1918, bred by Mrs. J. Putnam, Home Farm, Fairingdon, near Exeter; s Osmaston (imported) Fritz (4293), d Rochford (imported) Joukje (19094), s d Tjeintgumer (5405 F.R.S.).

#### **CLASS 102.—British Friesian Bull, calved in 1919. [6 entries.]**

**I. (26.)**—SIR J. RAMSDEN, BART., Bulstrode, Gerrard's Cross, Bucks, **Clockhouse King Akrin**, born 22nd January, bred by T. Williams, Pynesfield Manor, Bucks; s Clockhouse Rinlod (7513), d Garton Akke 6th (17794), s d Albert 2nd (5611 F.R.S.).

**II. (24.)**—H. HALE, Findon, Worthing, Sussex, **Northdean Myrtle King**, born 27th June, bred by G. Holt Thomas, North Dean, Hughenden, Bucks; s Hedge's Second Series (6427), d Kingswood Myrtle Leaf (25220), s d Kingswood (imported) Ynte (4047).

**III. (21.)**—E. R. DEBENHAM, Bladen Dairy Farms, Dorchester, **Bladen Kicker**, born 23rd June; s Bladen Robert 2nd P.I. (1347), d Golf Melfromijn (2470), s d Golf (imported) Botermijn.

**R.**—R. AND I. McROBERT, Colney Park, St. Albans, **Colney Raja**, born 20th May; s Dell Hollander (7655), d Flemington Peggy (24550), s d Colton (imported) Vic Bram (3705).

**V.H.C.**—SIR J. E. E. SHELLEY ROLLS, BART., J.P., Avington, Winchester, Hants, **Avington Victor**, born 17th May; s Melford Bute (6667), d Avington Jane, s d Terling Strokes (739).

### **SPECIAL PRIZE.**

GIVEN BY MAJOR VERE KER SEYMER.

*A Cup, value £10 10s. for the best Milking Cow or Heifer in Class 99.*

**I.**—A. AND J. BROWN, Haydon Hill Farm, Aylesbury, Bucks, **Hedge's Dutch Stately** (24956), born 25th November, 1916; s Hedge's (imported) Fokke 2nd (3993), d Hedge's Stately (1916).

**R.**—G. T. EATON, Thurston Hall, Framfield, Sussex, **Kirkhill Nellie 3rd** (18274), born 11th July, 1914, bred by Dr. Sinclair, Kirkhill, Rigg, Aberdeen, Scotland; s Colton Queen's Own (97), d Kirkhill Nellie (2016).

**JERSEY.**

(The Prizes in Class 103 were given by the English Jersey Cattle Society.)

**CLASS 103.**—*Cow or Heifer, in-Milk, entered in or eligible for entry in the English Jersey Herd Book, bred by Exhibitor, and sired in Great Britain or Ireland.* [7 entries.]

**I. (25.)**—MRS. EVELYN, Wotton House, Dorking, whole, **Wotton Margaret**, born 13th June, 1914; s Yeovil Lad (10833), d Wotton Daisy Noble 25th (500), s d Pavilion's Noble (10035).

**II. (23.)**—MRS. EVELYN, whole. **Wotton Velvet**, born 6th April, 1917; s Red Cloud (11818), d Wotton Vinolia (Vol. xxvi, p. 416), s d Illustrious (10289).

**III. (22.)**—MRS. EVELYN, whole, **Wotton Lady Vil**, born 13th April, 1915; s Yeovil Lad (10833), d Lady May 22nd (341), s d Royal Reward (9413).

**R. & V.H.C.**—LADY LUDLOW, Luton Hoo, Beds, whole, **Lily May 8th**, born 10th October, 1917; s Cute's Lad (12261), d Lily May 2nd (Vol. xxiii, p. 337), s d Amine's Lad (9474).

**V.H.C.**—G. BERRY, Mount Bures, Bures S.O., Suffolk, whole, **Nimrod's Dinah 4th** (Vol. xxix), born 11th September, 1915; s Thorn's Aurelius 2nd (12171), d Nimrod's Dinah 3rd (Vol. xxvii), s d Postmaster (11110).

**CLASS 104.**—*Jersey Cow, in-Milk, calved before 1917.* [15 entries.]

**I. (210.)**—MRS. EVELYN, Wotton House, Dorking, whole, **Wotton Margaret**, born 13th June, 1914; s Yeovil Lad (10833), d Wotton Daisy Noble 25th., (500), s d Pavillon's Noble (10035).

**II. (25.)**—MAJOR THE HON. H. PEARSON, Cowdray Park, Midhurst, Sussex, whole, **Bessy's Belle**, born 29th March, 1910, bred by E. Mauger, St. Brelade, Jersey; s Brighton (4043 P.S.H.C.), d Bessy's Remembrance (12325), s d Jolly Sailor (3496).

**III. (22.)**—W. D. KNIGHT, Rapkyns, Horsham, Sussex, broken, **Goddington Petune 2nd**, born 3rd March, 1914, bred by A. Miller-Hallett, Goddington, Chelsfield, Kent; s Golden Chance's Noble, d Petune's Baby, s d Benedictine's Boy.

**R. & V.H.C.**—MRS. RUDD, Felbridge Park Farm, East Grinstead, whole, **Meadow Vale Pride**, born 1st April, 1913, bred by H. L. Palmer, Grouville, Jersey; s Cyclone 3rd, d Regondame's Pride, s d Irvington.

**V.H.C.**—E. A. STRAUSS, M.P., Kingston House, Abingdon, Berks, whole, **Gipsy Amira** (H.C. 31), born 10th December, 1914, bred by J. F. Brideaux, Jersey; s Hamptonne Grey (4995), d Gipsy Diana (18476), s d Diana's Champion (4367).

**H.C.**—THE LATE MISS E. M. ENDERBY, Beckington, Bath, whole, **Laitova**, born 2nd May, 1916, bred by J. J. Le Corien, Jersey; s Jemima's King, d La Fontaine's Buttercup, s d Rozel's Noble. —MRS. HAYES SADLER, Narsebury, Sutton Scotney, whole, **Donna Ypres**, born 26th July, 1915, bred by J. B. Labey, Jersey; s Fontaine's Oxford Lad (12002), d Donna Victoria (19474), s d Sigmund (11542). —R. BRUCE WARD, Godington, Ashford, Kent, whole,

**Fine Lace**, born 25th March, 1915, bred by A. G. Le Brun, Trinity, Jersey; s Fern's Oxford Noble (11684), d Glycola, s d Patty's Prince (10380). **SIR G. S. WHITE, BART.**, Hollywood Tower, near Bristol, whole, **Mon Plaisir's Princess**, born 27th March, 1914, bred by J. Le C. Arthur, Mon Plaisir, St. Mary; s General Cowslip (10960), d Grace Dear (14914 P.S.C.), s d Oakland's Glory (9370).—**R. BRUCE WARD**, whole, **Ida**, born 15th March, 1914, bred by Major J. Baldwin, Northfield, Worcestershire; s Antidote (10843), d Matilda, s d Marshall MacMahon (9695).

**C.**—**MRS. EVELYN**, Wotton House, Dorking, whole, **Vervain's Bell 3rd**, born 5th June, 1913, bred by A. W. Brise, Spain's Hall, Braintree, Essex; s Midsummer (11064), d Vervain's Bell 16th (406), s d Chorister (6815).—**MRS. RUDD**, whole, **Cygnus 3rd**, born 21st September, 1916, bred by H. V. Thompson, Oving House, Aylesbury; s Daystar, d Swansea, s d Swansdown.

**CLASS 105.—Jersey Cow or Heifer, in-Milk, calved in 1917.** [11 entries.]

**I. (210).**—**MRS. HAYES SADLER**, Norsebury, Sutton Scotney, broken, **Wotton Catriona**, born 27th April, bred by Mrs. Evelyn, Wotton, Dorking; s Red Cloud (11818), d Catrion (Vol. xxiv, p. 267), s d Noble Jolly Sultan (10022).

**II. (25).**—**MRS. EVELYN**, Wotton House, Dorking, whole, **Wotton Velvet**, born 6th April, 1917; s Red Cloud (11818), d Wotton Vinolia (Vol. xxvi, p. 416), s d Illustrious (10289).

**III. (22).**—**R. BRUCE WARD**, Godington, Ashford, Kent, whole, **Maytham Pauline**, born 20th July, bred by the Hon. H. J. Tennant, Great Maytham, Kent; s Strathcona (12772), d Christmas Rush, s d Sweetbread Lad 2nd (11560).

**R.**—**J. H. N. ROBERTS**, Weybeard's Farm, Harefield, Middlesex, brown (whole), **Quaintness**, born 4th April, bred by J. P. Amy, St. Ouen, Jersey; s Kingsway, d Curious, s d Gilbert.

**H.C.**—**MRS. RUDD**, Felbridge Park Farm, East Grinstead, Sussex, whole, fawn, **Raleigh's Queen**, born 21st July, bred by Dr. H. Corner, Brook House, New Southgate, N.; s Commodore, d Sea Queen, s d Sea Lord.

**CLASS 106.—Jersey Heifer, in-Milk, calved in or since 1918.** [11 entries.]

**I. (210).**—**W. M. CAZALET**, Fairlawne, Tonbridge, whole, **Ciddie Girl**, born 15th May, 1918, bred by J. Le Ruez, St. Ouen, Jersey; s The Cid (12473), d Adela's Oxford Girl, s d Oxford Majesty (4057).

**II. (25).**—**MRS. EVELYN**, Wotton House, Dorking, whole, **Wotton Act of Justice**, born 1st April, 1918; s Royal Belle's Actor (5464), d Justice 4th (Vol. xxx, p. 303), s d Prince Guide (4929).

**III. (22).**—**MRS. A. F. HAYES SADLER**, Norsebury, Sutton Scotney, broken, **Wotton Vin Rouge**, born 29th March, 1918, bred by Mrs. Evelyn, Wotton, Dorking; s Red Cloud (11818), d Wotton Vinolia, s d Illustrious (10289).

**R. & H.C.**—**L. E. TUBBS**, Stapleton, Potter's Bar, whole, **Fleurette's Princess**, born 17th March, 1918; s Cute's Lad (Vol. xxviii), d Fleurette's Darling, s d Royal Guide.

**CLASS 107.—*Jersey Heifer, calved in 1919.* [15 entries.]**

**I. (210.)**—W. M. CAZALET, Fairlawne, Tonbridge, whole, **Eastern Queen Laxton 2nd**, born 26th January, bred by J. A. Gibaut, Trinity, Jersey; s Oxford's Fern Hope (5496), d Western Queen Laxton (20151).

**II. (25.)**—W. D. KNIGHT, Rapkyns, Horsham, Sussex, whole, **Rapkyns Perfume**, born 7th February; s Structure, d Goddington Petune 2nd, s d Golden Chance's Noble.

**III. (22.)**—MRS. EVELYN, Wotton House, Dorking, whole, **Wotton Sandaisy**, born 24th June; s Wotton Sandy (12814), d Wotton Red Daisy 29th (385), s d Red Cloud (11818).

**R. & V.H.C.**—R. BRUCE WARD, Godington, Ashford, Kent, whole, **Roselle**, born 10th April; s Boaz (12846), d Capsella, s d Capsicum (10892).

**V.H.C.**—THE LATE MISS E. M. ENDERBY, Beckington, Bath, black, **Beckington Midge**, born 22nd June; s Broadland's Master, d Mosquito.

**H.C.**—MRS. RUDD, Felbridge Park Farm, East Grinstead, whole fawn, **Early Morning**, born 18th May; s Fire King, d Premature, s d Vulturno.—MRS. G. THURSBY, Fountain Court, Brook, New Forest, broken, **Rampion**, born 19th June; s Wotton Red Fox (13156), d Rugwort (Vol. xxx).

**C.**—SIR G. S. WHITE, BART., Hollywood Tower, near Bristol, broken, **Nicotiana of Hollywood**, born 12th March; s Hero of Hollywood (12026), d Raleigh's Wave, s d Financial Raleigh Sultan (11685).

**CLASS 108.—*Jersey Bull, calved in 1916 or 1917.* [3 entries.]**

**I. (210.)**—MRS. RUDD, Felbridge Park Farm, East Grinstead, Sussex, whole, **Fire King**, born 15th April, 1916, bred by the late Lord Poltimore, Poltimore Park, Exeter; s Red Rattle, d Fairy Fern, s d Raleigh Fairy Boy.

**II. (25.)**—BRIG.-GEN. J. T. WIGAN, C.B., C.M.G., D.S.O., M.P., Danbury Park, Chelmsford, Essex, whole, **Red Ensign** (Vol. xxxi), born 2nd May, 1917, bred by H. V. Clark, Lyndsays, Ingatestone, Essex; s Illustrious (10289), d Wotton Red Egg (Vol. xxvii, p. 42), s d Red Cloud (11818).

**CLASS 109.—*Jersey Bull, calved in 1918.* [14 entries.]**

**I. (210.)**—W. D. KNIGHT, Rapkyns, Horsham, Sussex, nearly whole, **Rapkyns Black Knight**, born 19th June; s Mulcaster, d Green Cliff Daisy 3rd, s d Fontaine's Hope.

**II. (25.)**—LADY LUDLOW, Luton Hoo, Beds., whole, **Fairy Lad**, born 13th May; s Cute's Lad (12261), d Fairness (Vol. xxviii, p. 251), s d China's Fairy Boy (9869).

**III. (22.)**—MISS C. B. LUCAS, Great Culverden, Tunbridge Wells, whole, **Culverden Pioneer**, born 18th April; s Pioneer's Noble, d La Sente's Fairy (Vol. xxix, p. 295), s d Self Acting (11147).

**R. & V.H.C.**—SIR G. S. WHITE, BART., Hollywood Tower, near Bristol, whole, **Beuvelaude Emperor**, born 6th July, bred by S. De La Haye, St. Martin, Jersey; s Dimple Golden Plymouth, d Georgina 11th, s d Campanile's Emperor.

**V.H.C.**—J. E. EASTWOOD, Wade Court, Havant, whole, **Dairylike's Cid** (12894), born 22nd January, bred by R. R. Lempriere, St. Martin's, Jersey; s The Cid (12473), d Dairylike 7th (21249 P.S.H.C.), s d Village Knight (4905).—**MRS. A. F. HAYES SADLER**, Norsebury, Sutton Scotney, whole, **Bayleaf Cid** (12832), born 19th January, bred by A. G. Norman, Trinity, Jersey; s The Cid (12473), d Bayleaf 74th (22131), s d Financial Noble (11312).—**H. L. POPHAM**, Hunstrete House, Pensford, near Bristol, whole, **Maraca's Lad**, born 27th May, bred by E. Leonard, St. Ouen's, Jersey; s Fern's Oxford Noble 2nd (12613), d Noble Fern Maracas (23324), s d Golden Fern's Noble.—**HON. MRS. E. SMYTH**, Ashton Court, Bristol, whole, **General Mikado**, born 2nd April, bred by W. Alexander, St. Mary's, Jersey; s General Cowslip, d Arkona, s d Rower.—**E. A. STRAUSS**, M.P., Kingston House, Abingdon, Berks. whole, **Knight of Beechwood**, born 25th February, bred by J. Le Boutillier, St. Mary's (imported); s Rosy's General Cowslip (12756), d Cowslip Gipsy (17369 P.S.H.C.), s d General Cowslip (10960).

**H.C.**—**R. BRUCE WARD**, Godington, Ashford, Kent, whole, **Blazer**, born 27th January; s Reynard the Fox (12124), d Flame, s d Goodnight (9616).

#### CLASS 110.—*Jersey Bull, calved in 1919.* [12 entries.]

**I. (£10.)**—**R. BRUCE WARD**, Godington, Ashford, Kent, nearly whole, **Pilgrim**, born 14th April; s Prometheus, d Evergreen, s d Catillon's Prince (11639).

**II. (£5.)**—**MRS. RUDD**, Felbridge Park Farm, East Grinstead, whole, **Essex**, born 27th January; s Cowslip Pioneer, d Slim Jim's Lass, s d Slim Jim.

**III. (£2.)**—**BRIG.-GEN. J. T. WIGAN**, C.B., C.M.G., D.S.O., M.P., Danbury Park, Chelmsford, Essex, whole, **Danbury Red King**, born 9th June; s Red Ensign (Vol. xxxi), d Mitylene (Vol. xxvii, p. 85) s d Topsy's Noble (10116).

**R. & V.H.C.**—**MRS. A. F. HAYES SADLER**, Norsebury, Sutton Scotney, whole, **Don Cid**, born 24th March; s Cid (12473), d Dona Ypres (Vol. xxx), s d Fountain's Oxford Lad (12003).

**V.H.C.**—**THE LATE MISS E. M. ENDERBY**, Beckington, Bath, whole, **Mystery's Son**, born 15th May; s Broadland's Son, d Mystérieuse.—**HON. MRS. E. SYMTH**, Ashton Court, Bristol, whole, **Lizzie's Boy**, born 26th February; s Lord Oxford (12376), d Lizzie (Vol. xxviii, p. 294).

**H.C.**—**L. E. TUBBS**, Stapleton, Potter's Bar, whole, **Fleurette's Prince**, born 16th February; s Wotton Daisy Chain (13154), d Fleurette's Darling, s d Royal Guide.

### GUERNSEY.

(£20 towards the Prizes in the Guernsey Classes were given by the English Guernsey Cattle Society.)

#### CLASS 111.—*Guernsey Cow, in-Milk, calved before 1917.* [11 entries.]

**I. (£10.)**—**MRS. W. HOWARD PALMER**, Murrell Hill Binfield, Berks, lemon and white, **Donata 7th of Warren Wood** (9949), born 1st January, 1913, bred by the late J. Smail, Warren Wood, Hayes, Kent; s Godolphin Bar Gold (2136), d Donnington Eversweet (6113), s d Donnington Lad (1369).



**II. (25.)**—MRS. F. PRATT BARLOW, Lynchmere House, Haslemere, fawn and white, **Blue Bell of Goodnestone**, born 9th April, 1914, bred by H. F. Plumtre, Goodnestone Park; s Royal Sequel (2511), d Ashburnham Blue Bell (7529), s d Charmand of the Gron (1809).

**III. (22.)**—MRS. JERVOISE, Herriard Park, Basingstoke, fawn and white, **Fanny du Foulon 22nd** (10013), born 3rd July, 1911, bred by J. Le Page, St. Andrew's, Guernsey; s Aldernay 2nd (2215 P.S., R.G.A.S.), d Fanny du Foulon 13th (5734 P.S., R.G.A.S.).

**R.**—A. TAYLOR, Rowde, Devizes, Wilts, fawn and white, **Fantail Floss 2nd**, born 16th April, 1916, bred by A. Crocker, Yerbourg, St. Martin's, Guernsey; s Bob of the Haye du Puits (2963 P.S.), d Primrose of the Courtil Ronchin (3933 F.S.).

**C.**—MRS. R. C. BAINBRIDGE, Elfordleigh, Plympton, Devon, fawn and white, **Trequean Daisy 3rd** (12451), born 22nd February, 1916, bred by W. Penrose, Chapel Street, St. Just, Cornwall; s Trequean Pete, d Trequean Daisy.—G. F. FERRAND, Morland Hall, Alton, Hampshire, fawn and white, **Fussey's Dora** (10036), born 21st July, 1912, bred by J. T. White, La Rous-saillerie, Guernsey; s Clairvoyante's Sequel (2279 P.S., R.G.A.S.), d Fussey (3688 F.S., R.G.A.S.).—G. F. FERRAND, fawn and white, **Mildred of Bel Air** (13752), born 18th May, 1914, bred by the Hon. C. R. Molesworth, Hotel Bel Air, Sark; s Sylph's Majestic (3042 P.S., R.G.A.S.), d Mildred of Park Farm, (7215 P.S., R.G.A.S.), s d Squire of Beaulieu (1437 P.S., R.G.A.S.).

**CLASS 112.—Guernsey Heifer, in-Milk, calved in 1917. [3 entries.]**

**I. (210.)**—MRS. R. C. BAINBRIDGE, Elfordleigh, Plympton, Devon, fawn and white, **Trequean Ruby 4th** (13158), born 16th May, bred by W. Penrose, Chapel Street, St. Just, Cornwall; s Trequean Pete 2nd (3246), d Trequean Ruby, 2nd (11033), s d Trequean Prince 2nd (2678).

**II. (25.)**—MRS. F. PRATT BARLOW, Lynchmere House, Haslemere, fawn and white, **Tregothnan Seaweed** (13120), born 14th October, bred by Viscount Falmouth, Cornwall; s Nicolle's Fleurie Sequel (3378), d Tregothnan Sea Breeze (11005), s d Raymond of the Preel 12th (2631).

**III. (22.)**—A. H. HUSSEY, Maincombe, Crewkerne, light fawn and white, **Herriard Yellow Star 2nd**, born 20th June, bred by Mrs. Jervoise, Herriard Park, Basingstoke; s Herriard Valentine (2979), d Vellow Star (10755).

**CLASS 113.—Guernsey Heifer, calved in 1918. [10 entries.]**

**I. (210.)**—MRS. W. H. PALMER, Murrell Hill, Binfield, Berks, lemon, **Murrell Dainty** (13775), born 16th May; s Murrell Fido (3009), d Donata 7th of Warren Wood (9949), s d Godolphin Bar Gold (2136).

**II. (25.)**—MRS. JERVOISE, Herriard Park, Basingstoke, fawn and white, **Herriard Golden Flower** (13598), born 14th January; s Herriard du Foulon (3156), d Flower of Ville du Roi 4th (11347), s d Herriard du Foulon.

**III. (22.)**—MRS. F. PRATT BARLOW, Lynchmere House, Haslemere, fawn and white, **Lynchmere Blanche**, born 5th April; s Robert's Boy Sequel (2496), d Ranunculus 21st (10898), s d Royal Sequel (2511).

**R.**—W. F. TRUMPER, 11, Market Place, Devizes, Wilts, fawn and white, **Dahlia Polly 2nd**, born 7th April, bred by T. Manger, Le Bourg. Forest, Guernsey, s Froome's Flora's Pride (3672 P.S.), d Dahlia Polly (14482 P.S.).

**V.H.C.**—F. SWANTON, Overton, Marlborough, Wilts, fawn and white, **Lady of the Manor**, born 16th August, bred by T. J. Elliot Saumarez Manor Farm, St. Martin's, Guernsey; s Hero 4th of King's Mills Lodge (3608 P.S.), d Damint of Amherst (5041 F.S.).

**H.C.**—F. R. MOSER, Broadley, Sway, Hants, fawn and white, **Golden Aster**, born 13th September; s Dene Gay Boy (3302), d Godolphin Mignonette (7272), s d Jano of the Lorier (1506).

**CLASS 114.—Guernsey Heifer, calved in 1919. [10 entries.]**

**I. (210.)**—J. C. Forster, Clatford Mills, Andover, fawn and white, **Clatford Meadow Sweet**, born 17th May; s Lynchmere Charmante 4th (3177), d Clatford Meadow Sweet 2nd, s d Prince (58 P.S., R.G.A.S.).

**II. (25.)**—MRS. R. C. BAINBRIDGE, Elfordleigh, Plympton, Devon, fawn and white, **Elfordleigh Patricia**, born 2nd July; s Stagenhoe Charmant 4th (3036), d Elfordleigh Patty (8940), s d Linden's Sequel.

**III. (22.)**—SIR E. HAMBRO, K.C.V.O., Milton Abbey, Dorset, lemon and white, **Milton Daisy 3rd**, born 23rd April; s Milton Rue 3rd (3369), d Milton Daisy 1st (11546).

**R.**—F. R. MOSER, Broadley, Sway, Hants, fawn, **Cream Bun**, born 7th March; s Ladock Field Marshal (3549), d Polly of Harrismills 3rd (10871), s d Master Evelyn of Glynn (2484).

**V.H.C.**—MRS. JERVOISE, Herriard Park, Basingstoke, fawn and white, **Mulberry 4th**, born 21st January, bred by the Hon. C. R. Molesworth, Bel Air, Sark; s My Delight of Park Farm, d Mulberry (9689 P.S., R.G.A.S.).

**H.C.**—MRS. W. HOWARD PALMER, Murrell Hill, Binfield, Berks, lemon, **Murrell Sunbeam**, born 5th April; s Broom Royal Admiral (3478), d Murrell Silvia (12988), s d Lynchmere Lord Roberts 2nd (2794).

**C.**—MRS. JERVOISE, fawn and white, **Freesia's Honour**, born 14th February; s Valentine's Honour of the Parsée (3826), d Freesia 16th (11913), s d Honoria's Sequel.—F. MAGGS, West Lavington, Devizes, Wilts, fawn and white, **Lavington's Star**, born 12th January; s Bon Espoir Advance (3913 P.S.), d Les Dunes Pet (15422 P.S.), s d Governor of Myrtle Place 2nd (2746 P.S.).

**CLASS 115.—Guernsey Bull, calved in 1916 or 1917. [4 entries.]**

**I. (210.)**—MRS. R. C. BAINBRIDGE, Elfordleigh, Plympton, Devon, fawn and little white, **Hamill of Marazon** (3334), born 14th December, 1916, bred by Lady M. Boscawen, Tregyc, Perranwell, Cornwall; s Tregonning Good Friday 2nd (2661), d Fancy (7634), s d Eryngium (2016).

**II. (25.)**—O. P. RUBECK, Valencia, Meath Green Lane, Horley, Surrey, fawn and white, **Elfordleigh Regal** (3512), born 3rd November, 1917, bred by Mrs. Bainbridge, Elfordleigh; s Elfordleigh Prince Royal (3125), d Trequenan Maggie 2nd (10402).

**III. (22).—**MRS. F. PRATT BARLOW, Lynchmere House, Haslemere, fawn and white, **Pride of Vimiera** (3577), born 27th June, 1917, bred by F. Bellows, St. Peter's Port, Guernsey; s Valentine's Honour of the Passée (3784), d Dolly Gray 3rd of Vimiera (14728), s d Flora's Sequel of Vimiera (2921).

**R.—**MRS. W. HOWARD PALMER, Murrell Hill, Binfield, Berks, lemon, **Murrell Governor King of L. Etenierie** (3756), born 8th April, 1917, bred by Mrs. S. Le Provost, L. Etenierie Castel, Guernsey; s Governor's King Prize (3473), d Lily 2nd of Les Bordages (13263), s d Governor of the Chene (1297).

**CLASS 116.—Guernsey Bull, calved in 1918. [7 entries.]**

**I. (210).—**MRS. F. PRATT BARLOW, Lynchmere House, Haslemere, fawn, **Governor 4th des Ruettes** (3718), born 23rd May, bred by Mrs. J. Naflet, Les Ruettes, St. Saviour's, Guernsey; s Polly's Governor des Ruettes's (3906), d Beauty des Ruettes (6834), s d Golden Noble 2nd (1524).

**II. (25).—**SIR E. HAMBRO, K.C.V.O., Milton Abbey, Dorset, dark lemon fawn, **Bladen Prime Minister** (3651), born 20th June, bred by Mrs. F. Pratt Barlow, Lynchmere House, Haslemere; s Polly's Pride 2nd (3387), d Lynchmere Primula 2nd (12213).

**III. (22).—**G. F. FERRAND, Morland Hall, Alton, Hampshire, fawn and white, **Victor 3rd of the Barras**, born 14th June, bred by T. Foss, Les Barras, Guernsey; s Sequel's Mascot (3301 P.S., R.G.A.S.), d Moss Rose 6th of the Barras (9697 P.S., R.G.A.S.), s d Sequel's Monogram (1838 P.S., R.G.A.S.).

**R.—**MRS. L. CORBETT, Hockley House, Alresford, Hants, fawn, **Fancy's Dream**, born 8th June, bred by Sir H. Lennard, Bart., Wickham Court, West Wickham, Kent; s Warbler's Dream, d Wickham Fancy 8th, s d Wickham May King.

**V.H.C.—**MRS. W. HOWARD PALMER, Murrell Hill, Binfield, Berks, lemon, **Murrell Jolly Laddie** (3766), born 23rd November; s Murrell Jolly Boy (3193), d Langley Vivian (9075), s d Merton Sir William (1970).

**CLASS 117.—Guernsey Bull, calved in 1919. [10 entries.]**

**I. (210).—**F. B. DALRYMPLE, Bartley Lodge, Cadnan, Hants, fawn, **Bartley Governor**, born 21st March, bred by American Red Cross, Salisbury; s Governor's Royal Star (3890), d Lady Peer of L. Etenierie (14509 P.S.).

**II. (25).—**H.R.H. THE DUCHESS OF ALBANY, Claremont Farm, Esher-Surrey, fawn and white, **Claremont Prince of Orange**, born 28th March; s Elfordleigh Prince Royal (3125), d Elfordleigh Petunia (10671), s d Hero of the Village (2599).

**III. (22).—**H.R.H. THE DUCHESS OF ALBANY, fawn and white, **Claremont Gipsy King**, born 2nd June; s Brittleware Princeling (3282), d Claremont Gipsy Love (12630), s d Devaux Gift (2938).

**R.—**MRS. L. CORBETT, Hockley House, Alresford, Hants, fawn, **Happy Warrior**, born 8th April, bred by Col. Aubertin, The Weir House, Alresford, Hants; s Itchen Gay Raider, d Bighton Mica, s d Bighton Onyx.

**V.H.C.—**MRS. JERVOISE, Herriard Park, Basingstoke, **Bickleigh 4th**, born 2nd June; s Valentine's Honour, d Lady Blanche 2nd, s d Galaxy's Sequel.

**H.C.**—**MRS. R. C. BAINBRIDGE**, Elfordleigh, Plympton, Devon, fawn and white, **Elfordleigh Majesty**, born September 29th; s Elfordleigh Dreadnought (3688), d Elfordleigh Maggie (11310), s d Royalty 9th.—**MRS. W. HOWARD PALMER**, Murrell Hill, Binfield, Berks, lemon and white, **Murrell Recruit**, born 26th June; s Murrell Governor's King of L. Etiennerie (3765), d Murrell Romance (12987), s d Murrell Gay Boy (3192).—**MRS. F. PRATT BARLOW**, Lynch mere House, Haslemere, fawn, **Lynchmere Lord Roberts 15th** (Vol. xxxvi, E.G.H.B.), born 12th June; s Robert's Boy's Sequel (2496), d Citron 26th (9352), s d Charmant 4th of the Gron (2124).

### DEXTER.

**CLASS 118.**—*Dexter Cow or Heifer, in-Milk, calved in or before 1917.* [10 entries.]

**I. (410.)**—**A. C. KING**, Braishfield Manor, Romsey, black, **La Mancha Madeline** (2272), born March, 1913.

**II. (25.)**—**LADY K. MORANT**, Brokenhurst Park, Hants, black, **Peach Blossom of Claragh** (2535), born 21st February, 1917, bred by Captain E. Benn, Mount Leader, Null Street, Co. Cork; s Gort Ned 5th (607), d Gort Peach 9th (2540). s d Gort Fred 2nd (584).

**III. (22.)**—**A. W. BAILEY HAWKINS**, Stagenhoe Park, Welwyn, Herts, red, **Gort Mite 5th** (2539 H.B., R.D.S.), born 21st April, 1913; s Gort Punch 3rd (592), d Gort Mite (2293), s d Gort Sam (516).

**R.**—**LADY K. MORANT**, black, **Gort Woodbine 7th** (2498), born 4th February, 1911, bred by D. M. Rattray, Ballyunion, Ireland; s Gort Fred (569), d Gort Woodbine 3rd (2331), s d Gort Punch (526).

**CLASS 119.**—*Dexter Heifer, calved in 1918 or 1919.* [16 entries.]

**I. (410.)**—**A. C. KING**, Braishfield Manor, Romsey, red, **Braishfield Red Rose** (Vol. xx, E.K. & D.H.B.), born 11th July, 1919; s Braishfield Paddy (624), d Braishfield Bloom (2300), s d Home Rule (563).

**II. (25.)**—**H. G. JONES**, Downford, Mayfield, Sussex, black, **Downford Dittany**, born June, 1918.

**III. (22.)**—**MRS. NUTT**, Hampton House, Hampton-in-Arden, black, **Fil-longley Fury**, born 9th December, 1918; s Fillongley Financier (609), d Fil-longley Fiend (2417).

**R.**—**LADY K. MORANT**, Brokenhurst Park, Hants, black, **Brokenhurst Kenmare 3rd**, born 16th April, 1918; s Oakridge Signor (573), d Brokenhurst Kenmare (2226), s d Brien Boru (460).

**CLASS 120.**—*Dexter Bull, calved in 1917, 1918, or 1919.* [6 entries.]

**I. (410.)**—**LADY K. MORANT**, Brokenhurst Park, Hants, black, **Brokenhurst Morella**, born 4th September, 1918; s Brokenhurst Blighty (581), d Carthlough Cherry 3rd (2309), s d Home Rule (588).

**II. (25.)**—**MRS. H. PELY**, Lyndsays Farm, Ingatestone, Essex, black, **April Fool**, born 1st April, 1918, bred by Mrs. Nutt, White House, Filongley, Coventry; s Answers, d Fillongley Foxglove.

**III. (22.)**—H. G. JONES, Downford, Mayfield, Sussex, black, **Downford Dandy**, born January, 1918, bred by R. T. Robertson, The Hutch, Malahide, Co, Dublin.

• **R.**—E. P. PEYTON, Woodcote Lodge, near Kenilworth, black, **Woodcote Pedlar**, born 22nd May, 1917; s Grinstead Tramp (545), d Woodcote Pierrette (2143), s d Woodcote Paganini (532).

(The Prizes in Class 121 were given by the English Kerry and Dexter Cattle Society.)

**CLASS 121.** *Bull, calved in 1919, whose sire and dam were entered in the English Kerry and Dexter or Royal Dublin Society's Herd Book.*

**I. (210.)**—G. M. GIBBS, Gratwicke Hall, Flax Bourton, Somerset, black, **Barrow Mr. Murphy 2nd**, born 11th March, bred by H. M. Gibbs, Barrow Court, Flax Bourton, Somerset; s Barrow Beau 3rd, d Barrow Miss Murphy 3rd, s d Barrow Desmond.

**II. (23.)**—MRS. NUTT, Hampton House, Hampton-in-Arden, red, **Fillongley Fireman**, born August; s Fillongley Forester (630), d Gloriana (2492), s d Barrow Orphan (498).

**III. (22.)**—LADY K. MORANT, Brokenhurst Park, Hants, red, **Brokenhurst Cherry Ripe**, born 17th July; s Brokenhurst Rufus (601), d Carthlough Cherry 3rd (2309), s d Home Rule (588).

**R.**—A. C. KING, Braishfield Manor, Romsey, black, **Braishfield Golden Rule** (Vol. xx, E.K. & D.H.B.), born 22nd March; s Home Rule (563), d La Mancha Goody (2268).

### *SPECIAL PRIZE.*

GIVEN BY THE ENGLISH KERRY AND DEXTER CATTLE SOCIETY.

*The Devonshire Challenge Cup, for the Best Animal in Classes 118 to 121, bred by Exhibitor, and entered in or eligible for the English Kerry and Dexter Herd Book. The Cup to be won by the same Exhibitor with different animals three years in succession before becoming his absolute property.*

*The Certificate of Award of the English Kerry and Dexter Cattle Society will be given to the owner of the winning animal on each occasion the Cup is completed for.*

**I.**—LADY K. MORANT, Brokenhurst Park, Hants, black, **Brokenhurst Morella**, born 4th September, 1918; s Brokenhurst Blighty (581), d Carthlough Cherry 3rd (2309), s d Home Rule (588).

**R.**—A. C. KING, Braishfield Manor, Romsey, red, **Braishfield Red Rose** (Vol. xx, E.K. & D.H.B.), born 11th July, 1919; s Braishfield Paddy (624), d Braishfield Bloom (2300), s d Home Rule (563).

**ANY BREED.****CLASS 122.—*Dairy Cow, of any Breed, in-Milk or in-Calf.* [9 entries.]**

**I. (210.)**—OLYMPIA AGRICULTURAL CO., LTD., Offchurch, Leamington, red, **Iford Princess Gwynne 2nd**, born 11th March, 1911, bred by J. and H. Robinson, Iford, Lewes, Sussex: s Duke of Barrington (102070), d Countess Gwynne, s d Pendennis (86805).

**II. (25.)**—A. RUSSELL SMITH, North Houghton Manor, Stockbridge, roan Shorthorn, **Stockbridge Pride**.

**III. (22.)**—E. G. HARDING, Foxcote, Grittleton, Chippenham, roan Shorthorn, **Gem** born 1916.

**R.**—W. J. S. WHITE, Zeals, Wiltshire, born 15th March, 1914; s Vern Lictor (30164), d Quadrille, s d Eaton Garnet (26085).

(The Prizes in Class 229 were given by Lord Bledisloe.)

**CLASS 229.—*Dairy Bull of any age or Breed (entered or eligible for entry in the Herd Book of its Breed), the property of a member of a recognised Milk Recording Society in the County of Wilts, to be adjudged on the following scale of points:—Appearance, 60, Milking Strain of Pedigree or authentic milk records of parents, 40. (The pedigrees or milk records must accompany the entry)—***  
[9 entries.]

**I. (210.)**—MAJOR G. J. BUXTON, Tockenham Manor, Wootton Bassett, Wilts, red roan Shorthorn, **Tockenham Minstrel 3rd**, born 10th April; s Kelmescott Acrobat 4th, d Songstress, s d Lord Pailful (109243).

**II. (26.)**—THE EARL OF RADNOR, Longford Castle, Salisbury, Red Poll, **Ashmoor Foreman**, born 15th May, 1918, bred by A. C. Smith, Sutton Hall, Woodbridge, Suffolk; s Ashmoor Roberts (11091), d Rendlesham Floris (20524), s d Rendlesham Sirdar (9310).

**III. (24.)**—MAJOR G. J. BUXTON, red Shorthorn, **Tockenham Minstrel 2nd**, born 12th January; s Kelmescott Acrobat 4th, d Leazon Musical, s d Puddington Minstrel (100110).

**R.**—J. PHILIPSON, Manor Farm, Langford, near Salisbury, roan Shorthorn, **Wild Don**, born 28th February, 1916, bred by J. A. Attwater, Dry Leaze, Cirencester, s Dictator (125191), d Wild Maid 3rd, s d Lord Pailful (109243).

**H.C.**—D. COOMBS, Jun., Dinton Manor, Salisbury, red Shorthorn, **Lord Rememham 68th**, born 25th January, 1918, bred by Viscount Hambleden, Greenlands, Henley-on-Thames; s Adbolton Sovereign King (129029), d Lady Rememham 35th (Vol. lviii, p. 528), s d Earl of Oxford 12th (111651).

**C.**—MAJOR G. J. BUXTON, roan Dairy Shorthorn, **Tockenham Keystone**, 5th, born 22nd September, 1918, s Oxford Don (127216), d Wild Erin 22nd s d Fairlawne Justice (111728).

MILK TEST.

(See Regulation 64.)

**CLASS 123.**—*Cow, in-Milk, of any breed or cross, under 950lbs. live weight, yielding the largest quantity of Milk of normal character, containing at each time of milking 12 per cent. of total solids, of which not less than 3 per cent. shall be fat, the period of lactation being taken into consideration.* [13 entries.]

**I. (210).**—**R. BRUCE WARD**, Godington, Ashford, Kent, whole Jersey, **Ida**, born 15th March, 1914, bred by Major J. Baldwin, Northfield, Worcestershire; s Antidote (10843), d Matilda, s d Marshal MacMahon (9695).

**II. (25).**—**W. M. CAZALET**, Fairlawne, Tonbridge, broken Jersey, **Fairlawne Hussy**, born 8th August, 1916; s Sir Toby (12154), d Hussy 13th (Vol. xxiii, p. 317), s d MacDougall (9333). (Last calf February 19th, 1920.)

**III. (22).**—**DR. H. WATNEY**, Buckhold, Pangbourne, whole Jersey, **Lady Violette 2nd** (Vol. xxix, p. 293), born 22nd November, 1914; s C'assicum (10892), d Lady's Violette (Vol. xxiv, p. 347), s d Lady's Aurilius (10317). (Last calf January 31st, 1920.)

**R.**—**MRS. RUDD**, Felbridge Park Farm, East Grinstead, whole Jersey, **Meadow Vale Pride**, born 1st April, 1913, bred by H. L. Palmer, Grouville, Jersey; s C'yclone 3rd, d Regondame's Pride, s d Irvington. (Last calf March 24th, 1920.)

**H.C.**—**G. BERRY**, Mount Bures, Bures S.O., Suffolk, whole Jersey, **Nimrod's Dinah 4th** (Vol. xxix), born 11th September, 1915; s Thorn's Aurelius 2nd (12171), d Nimrod's Dinah 3rd (Vol. xxvii), s d Postmaster (11110). (Last calf December 16th, 1919.)

**C.** **MRS. EVELYN**, Wotton House, Dorking, whole Jersey, **Wotton Lady Vil**, born 13th April, 1915; s Yeovil Lad (10833), d Lady May 22nd (341), s d Royal Reward (9413). (Last calf October 8th, 1919).—**MRS. EVELYN**, whole Jersey, **Vervain's Bell 3rd**, born 5th June, 1913, bred by A. W. Brice, Spain's Hall, Braintree, Essex; s Midsummer (11064), d Vervain's Bell 16th (406), s d Chorister (6815). (Last calf December 6th, 1919).—**R. BRUCE WARD**, whole Jersey, **Fine Lace**, born 25th March, 1915, bred by A. G. Le Brun, Trinity, Jersey; s Fern's Oxford Noble (11681), d Glveola, s d Patty's Prince (10380). (Last calf April 13th, 1919)

**CLASS 124.**—*Cow, in-Milk, of any breed or cross, 950lbs. live weight or over, yielding the largest quantity of milk of normal character, containing at each time of milking 12 per cent. of total solids, of which not less than 3 per cent. shall be fat, the period of lactation being taken into consideration.* [13 entries.]

**I. (210).**—**DR. H. WATNEY**, Buckhold, Pangbourne, whole grey Jersey, **Sabina's Goose 2nd** (Vol. xxviii, p. 336), born 29th December, 1913; s Sabina (10436), d Goose (Vol. xv, p. 294), s d Brian (6479).

**II. (25.)**—THE MARCHIONESS OF GRAHAM, Easton Park, Wickham Market, Suffolk, **Gressenhall Southgate 6th** (25096), calved 26th August, 1914, bred by J. E. Hill.

**III. (22.)**—THE "HACHE" HERD, Muntham Court, Worthing, Sussex, and Bulstrode, Gerrard's Cross, Bucks, **Brookland's Sietske 4th**, (17052), born 7th April, 1913, bred by J. J. Oostra, Mantgum, Holland; s Bertus (5935), d H. Sietske (22599). (Last calf December 29th, 1919).

**E.**—CAPTAIN A. J. M. RICHARDSON, Seven Springs, near Cheltenham, **Stownpland Columbine** (25371), born 18th July, 1915, bred by G. Carter, Stownpland, Stowmarket, Suffolk; s Herontye Davyson (10421), d Woolmstone (21511), s d Fruitful (9574).

**H.C.**—W. G. LANGLANDS, Hazon House, Epsom, whole dark fawn Jersey, **Teasel's Snowdrop**, born 24th June, 1915, bred by Dr. Hoffman, Mayes Place, Warlingham; s Teasel's Capsicum (11562), d Princess Jessamine, s d Prince Tester. (Last calf February 4th, 1920).

**C.**—W. G. BUSK, J.P., Wraxall Manor, Rampisham, Dorchester, Dorset, **Wynford Daisy 2nd B** (349), born 5th December, 1909, bred by J. H. Chick, Wynford Eagle, Maiden Newton, Dorset; s Compton George (6011), d Wynford Daisy (A84). (Last calf January 17th, 1920).—W. D. CHICK, Compton Valence, Frampton, Dorchester, **Compton Glitter 3rd** (30838) born 13th December, 1914; s Compton Doctor (7985), d Compton Glitter 2nd, s d Wynthorpe Woodrough (6599).

(The Prizes in Class 125 were given by the Red Poll Cattle Society.)

**CLASS 125.**—*Red Poll Cow or Heifer, entered in Class 91, yielding the largest quantity of Milk of normal character, containing at each time of milking 12 per cent. of total solids, of which not less than 3 per cent. shall be fat, the period of lactation being taken into consideration.* [13 entries.]

**I. (210.)**—THE MARCHIONESS OF GRAHAM, Easton Park, Wickham Market, Suffolk, **Gressenhall Southgate 6th** (25096), calved 26th August, 1914, bred by J. E. Hill.

**II. (25.)**—CAPTAIN A. J. M. RICHARDSON, Seven Springs, near Cheltenham, **Stownpland Columbine** (25371), born 18th July, 1915, bred by G. Carter, Stownpland, Stowmarket, Suffolk; s Herontye Davyson (10421), d Woolmstone (21511), s d Fruitful (9574).

**III. (22.)**—MRS. A. MORRISON, Shawford Place, Shawford, Hants, **Gressenhall Dagmar** (24006), born 28th August, 1912, bred by J. E. Hill, Gressenhall, Dereham, Norfolk; s Gressenhall Storm King (10176), d Gressenhall Pansy (22578), s d Tring (10113). (Last calf March 10th, 1920).

**E.**—LORD HASTINGS, Melton Constable Park, Norfolk, **Melton May** (26365), born 30th September, 1914; s Acton Darius (10117), d Melton Ruby (22675), s d Davyson 302nd (9920). (Last calf April 24th, 1920).



# BUTTER TEST.

(See Regulation 64.)

(The Prizes in Class 126 were given by the English Jersey Cattle Society, and entries in it were subject to any conditions issued by that Society previous to the tests.)

**CLASS 126.**—*Cow, eligible for or entered in the English Jersey Herd Book, obtaining the greatest number of points by the practical test of the separator and churn, judged by the scale of points adopted by the English Jersey Cattle Society.* [24 entries.]

*Certificates of Merit were also awarded to Cows under 5 years old obtaining 30 points and to Cows 5 years old or over obtaining 35 points.*

**I. (Gold Medal or £10.)**—W. M. CAZALET, Fairlawne, Tonbridge, broken Jersey, **Fairlawne Hussy**, born 8th August, 1916; s Sir Toby (12154), d Hussy 13th (Vol. xxiii, p. 317), s d MacDougal (9333), (Last calf February 19th, 1920).

**II. (Silver Medal.)**—R. BRUCE WARD, Godington, Ashford, Kent, whole Jersey, **Ida**, born 15th March, 1914, bred by Major J. Baldwin, Northfield, Worcestershire; s Antidote (10843), d Matilda, s d Marshall MacMahon (9695).

**III. (Bronze Medal.)**—W. C. LANGLANDS, Hazon House, Epsom, whole dark fawn Jersey, **Teasel's Snowdrop**, born 24th June, 1915, bred by Dr. Hoffman, Mayes Place, Warlingham; s Teasel's Capsicum (11562), d Princess Jessamine, s d Prince Tester. (Last calf February 4th, 1920).

**Certificates of Merit.**—G BERRY, Mount Bures, Bures S.O., Suffolk, whole Jersey, **Nimrod's Dinah 4th** (Vol xxix), born 11th September, 1915; s Thorn's Aurelius 2nd (12171), d Nimrod's Dinah 3rd (Vol xxvii), s d Postmaster (11110) (Last calf December 16th, 1919).—MRS EVELYN, Wotton House, Dorking, whole Jersey, **Wotton Lady Vil**, born 13th April, 1915; s Yeovil Lad (10833), d Lady May 22nd (341) s d Royal Reward (9413) —(Last calf October 8th, 1919).—MRS. RUDD, Felbridge Park Farm, East Grinstead, whole Jersey, **Cygnus 3rd**, born 21st September, 1916, bred by H. V. Thompson, Oving House, Aylesbury; s Daystar, d Swansea, s d Swansdown. (Last calf December 19th, 1919).—R. BRUCE WARD, Godington, Ashford, Kent, whole Jersey, **Hilda**, born 24th August, 1916, bred by General Sir N. Lyttelton, Bell Hall, Stourbridge; s Periling's Chief (11801), d Fragrance, s d Soubrette's Glory (9784). (Last calf September 11th, 1919).—J. H. N. ROBERTS, Weybeard's Farm, Harefield, Middlesex, brown (whole) Jersey, **Quaintness**, born 4th April, bred by J. P. Amy, St. Ouen, Jersey; s Kingsway, d Curious, s d Gilbert.—DR. H. WATNEY, Buckhold, Pangbourne, whole grey Jersey, **Sabina's Goose 2nd** (Vol. xxviii, p. 336), born 29th December, 1913; s Sabina (10436), d Goose (Vol. xv, p. 294), s d Brian (6479).—DR. H. WATNEY, whole Jersey, **Lady Violette 2nd** (Vol. xxix, p. 293), born 22nd November, 1914; s Capsicum (10892), d Lady's Violette (Vol. xxiv, p. 347), s d Lady's Aurilium (10317). (Last calf January 31st, 1920).—DR. H. WATNEY, Buckhold, Pangbourne, whole Jersey, **Maple's Gem** (Vol. xxvi, p. 334), born 4th January, 1912; s

## xlvi Prizes awarded to Dairy Herds and Shropshire Sheep.

Violette's Maple 2nd (10819), d Pearl's Gem 2nd (Imported, Vol. xxii, p. 388). (Last calf January 2nd, 1920).—DR. H. WATNEY, whole Jersey, **Violin's Lady 3rd** (Vol. xxv, p. 491), born 24th June, 1911; s Sibina (10436), d Violin's Lady (Vol. xix, p. 426), s d Violin (8755). (Last calf December 11th, 1919.)

(The Prizes in Class 230 were given by Mrs. Jervoise, of Herriard Park, Basingstoke.)

**CLASS 230.**—*Cow, eligible for or entered in the English Guernsey Herd Book, obtaining the greatest number of points by the practical test of the separator and churn, judged by the scale of points adopted by the English Guernsey Cattle Society.* [11 entries.]

**I. (210).**—MRS. R. C. BAINBRIDGE, Elfordleigh, Plympton, Devon, fawn and white Guernsey, **Elfordleigh Roma** (12043), born 11th February, 1916; s Royalty 9th (2848), d Romula of Glynn (7078), s d Quick Step of Glynn (1704). (Last calf June 2nd, 1919).

**II. (25).**—MRS. FREVILLE COOKSON, Chute Standen, Andover, Hants, fawn Guernsey, **Iwerne Myrtle**, born 5th April, 1914, bred by J. H. Ismay, Iwerne Minster House, Blandford, Dorset s Lord Royal 2nd, d Cecelia of Goodnestone 3rd. (Last calf January 6th, 1920).

### DAIRY HERDS.

(The First, Second and Third Prizes in Class 231 were given by Hugh Morrison, Esq., M.P., and the Fourth Prize by the Salisbury and District Milk Recording Society.)

**CLASS 231.**—*Best managed Dairy Herd, owned by a member of the Salisbury and District Milk Recording Society (including Cow-sheds and Dairies.)* [13 entries.]

**I. (226 5s.)**—D., COMBES, Jun., Dinton Manor Farm, Salisbury.

**II. (215 15s.)**—M. W. GENCE, Stop Farm, Tisbury, Wilts.

**III. (210 10s.)**—W. DATE, Manor Farm, Bishopstone.

**IV. (25 5s.)**—WORT & WAY, Countess Farm, Amesbury.

**R. & V.H.C.**—E. F. ANDREWS, Manor Farm, Steeple Langford, Salisbury.

**V.H.C.**—F. ANDREWS, Little Langford Farm, Salisbury.—W. C. PARSONS, Church Farm, West Dean, Salisbury.

**C.**—F. MORGAN, Home Farm, Wilton, Salisbury.—E. J. TAUNTON, Bemerton, Salisbury.

## SHEEP.

### SHROPSHIRE.

(The First Prize in Class 127 was given by the Shropshire Sheep Breeders' Association.)

**CLASS 127.**—*Shropshire Shearling Ram.* [2 entries.]

**I. (210).**—R. E. BIRCH, Maes Elwy, St. Asaph.

**II. (25).**—R. E. BIRCH.

*Prizes awarded to Devon Longwoolled, South Devon & Kent Sheep.* xlix

CLASS 128.—*Pair of Shropshire Ram Lambs, dropped in 1920.* [2 entries.]

I. (£10.)—R. E. BIRCH, Maes Elwy, St. Asaph.

II. (£5.)—R. E. BIRCH.

CLASS 129.—*Pen of three Shropshire Shearling Ewes—First prize, £10—second, £5—third, £2.*

NO ENTRY.

DEVON LONGWOOLLED.

CLASS 130.—*Devon Longwoolled Shearing Ram.* [2 entries.]

I. (£10.)—F. WHITE, Torweston, Williton, Somerset.

II. (£5.)—F. WHITE.

CLASS 131.—*Pen of three Devon Longwoolled Shearling Ewes.* [2 entries.]

I. (£10.)—F. WHITE, Torweston, Williton, Somerset.

II. (£5.)—F. WHITE.

SOUTH DEVON.

CLASS 132.—*South Devon Shearling Ram.* [2 entries.]

I. (£10.)—W. HAWKE, JUN., Trebudannon, St. Columb, Cornwall.

II. (£5.)—W. HAWKE, JUN.

CLASS 133.—*Pair of three South Devon Shearling Ewes.* [2 entries.]

I. (£10.)—W. HAWKE, JUN., Trebudannon, St. Columb, Cornwall.

KENT OR ROMNEY MARSH.

(The Prizes in Class 134 were given by the Kent or Romney Marsh Sheep Breeders' Association.)

CLASS 134.—*Kent or Romney Marsh Two Shear Ram.* [5 entries.]

I. (£10.)—J. E. QUESTED, The Firs, Cheriton, Kent.

II. (£5.)—J. E. QUESTED.

III. (£2.)—O. C. MILLEN, Adisham Court, Canterbury, bred by R. L. Mond, J.P., Combe Bank, Sevenoaks.

R.—L. H. AND G. W. FINN, Westwood Court, Faversham.

C.—L. H. AND G. W. FINN.

**1 Prizes awarded to Kent or Romney Marsh and Southdown Sheep.**

**CLASS 135.—Kent or Romney Marsh Shearling Ram. [16 entries.]**

**I. (£10.)**—J. E. QUESTED, The Firs, Cheriton, Kent

**II. (£5.)**—O. C. MILLEN, Adisham Court, Canterbury.

**III. (£2.)**—L. H. AND G. W. FINN, Westwood Court, Faversham.

**R.**—J. E. QUESTED.

**H.C.**—O. C. MILLEN.—C. F. WOOD, Teynham Court, Sittingbourne, bred by W. S. and C. F. Wood, Sittingbourne.—C. F. WOOD.

**C.**—L. H. AND G. W. FINN, Westwood Court, Faversham—L. H. AND G. W. FINN.—THE HADLOW FLOCK CO., Grove's Farm, Snodland, near Rochester, Kent, bred by W. L. H. Roberts, Hillborough Court, Rochester.—O. C. MILLEN.

**CLASS 136.—Pair of Kent or Romney Marsh Ram Lambs, dropped in 1920. [6 entries.]**

**I. (£10.)**—THE HADLOW FLOCK CO., Grove's Farm, Snodland, near Rochester, Kent.

**II. (£5.)**—J. E. QUESTED, The Firs, Cheriton, Kent.

**III. (£2.)**—L. W. AND G. W. FINN, Westwood Court, Faversham.

**R.**—L. W. AND G. W. FINN.

**CLASS 137.—Pen of three Kent or Romney Marsh Shearling Ewes. [10 entries.]**

**I. (£10.)**—O. C. MILLEN, Adisham Court, Canterbury.

**II. (£5.)**—L. H. AND G. W. FINN, Westwood Court, Faversham.

**III. (£2.)**—O. C. MILLEN.

**R.**—L. H. AND G. W. FINN.

**H.C.**—J. E. QUESTED, The Firs, Cheriton, Kent.—J. E. QUESTED.

**C.**—LIEUT.-COL. M. G. E. BELL, Bourne Park, near Canterbury, bred by R. L. Mond, J.P., Combe Bank, Sevenoaks.

**SOUTHDOWN.**

(The Prizes in Class 138 were given by the Southdown Sheep Society).

**CLASS 138.—Southdown Two Shear Ram. [7 entries.]**

**I. (£10.)**—LADY LUDLOW, Luton Hoo, Beds.

**II. (£5.)**—SIR J. COLEMAN, BART., Gatton Park, Surrey.

**III. (£2.)**—SIR J. COLEMAN, BART.

**R.**—LADY FITZGERALD, Buckland, Faringdon, Berks, bred by Lord Northbourne, Betteshanger Park, Dover, Kent.

**C.**—B. OPPENHEIMER, Sefton Park, Stoke Poges, Bucks, bred by Sir J. Colman, Bart., Gatton Park, Surrey.

*Prizes awarded to Southdown and Hampshire Down Sheep.* 11

**CLASS 139.**—*Southdown Shearling Ram.* [9 entries.]

**I. (£10.)**—LADY FITZGERALD, Buckland, Faringdon, Berks.

**II. (£5.)**—H.M. THE KING, Sandringham.

**III. (£2.)**—SIR J. COLMAN, BART., Gatton Park, Surrey.

**H.C.**—LADY LUDLOW, Luton Hoo, Beds.

**CLASS 140.**—*Pair of Southdown Ram Lambs, dropped in 1920.* [6 entries.]

**I. (£10.)**—SIR J. COLMAN, BART., Gatton Park, Surrey.

**II. (£5.)**—LADY FITZGERALD, Buckland, Faringdon, Berks.

**III. (£2.)**—H.M. THE KING, Sandringham.

**R.**—B. OPPENHEIMER, Sefton Park, Stoke Poges, Bucks.

**H.C.**—LADY LUDLOW, Luton Hoo, Beds.

*SPECIAL PRIZE.*

GIVEN BY THE SOUTHDOWN SHEEP SOCIETY. UNDER CONDITION 67.

*Silver Medal or £1 for the Best Ram or Ram Lamb in Classes 138, 139 or 140.*

**I.**—LADY FITZGERALD, Buckland, Faringdon, Berks.

**R.**—LADY LUDLOW, Luton Hoo, Beds.

**CLASS 141.**—*Pen of three Southdown Shearling Ewes.* [5 entries.]

**I. (£10.)**—B. OPPENHEIMER, Sefton Park, Stoke Poges, Bucks.

**II. (£5.)**—SIR J. COLMAN, BART., Gatton Park, Surrey.

**III. (£2.)**—LADY LUDLOW, Luton Hoo, Beds.

**R.**—H.M. THE KING, Sandringham.

**C.**—H.M. THE KING.

**HAMPSHIRE DOWN.**

(The Prizes in Class 143 were given by the Hon. Lady Hulse, of Breamore House; in Class 147 by Major J. A. Morrison, D.S.O., of Basildon House, and in Classes 145, 148 and 149 and the Champion Prize by the Hampshire Down Sheep Breeders' Association.)

**CLASS 142.**—*Hampshire Down Shearling Ram.* [12 entries.]

**I. (£10.)**—MRS. B. A. L. JERVOISE, Herriard Park, Basingstoke, bred by J. Goldsmith, Blendworth, Horndean.

**II. (£5.)**—MRS. B. A. L. JERVOISE.

**III. (£2.)**—THE TRUSTEES OF THE LORD WANDSWORTH AGRICULTURAL COLLEGE, Long Sutton, near Winchfield, Hants.

**R.**—V. T. THOMPSON, Norton Manor, Sutton Scotney, Hants, bred by J. H. Ismay, Iwerne Minster, Blandford.

**H.C.**—SIR G. COOPER, BART., Hursley Park, Winchester.—THE HON. LADY HULSE, Breamore House, Breamore, Hants.—V. T. THOMPSON, bred by J. H. Ismay, Iwerne Minster, Blandford.

**C.**—THE HON. LADY HULSE.

**CLASS 143.**—*Hampshire Down Ram Lamb, dropped in 1920.* [21 entries.]

**I. (£12.)**—V. T. THOMPSON, Norton Manor, Sutton Scotney, Hants.

**II. (£7.)**—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, Berks.

**III. (£4.)**—TRUSTEES OF THE LORD WANDSWORTH AGRICULTURAL COLLEGE.

**IV. (£2.)**—SIR G. COOPER, BART., Hursley Park, Winchester.

**R.**—ITCHEN BREEDING STOCK FARM, LTD., Itchen Abbas, by Winchester bred by P. Nerinckx, Itchen Down Farm, Itchen Abbas.

**V.H.C.**—MRS. B. A. L. JERVOISE, Herriard Park, Basingstoke.

**H.C.**—THE HON. LADY HULSE, Breamore House, Breamore, Hants.—MRS. B. A. L. JERVOISE.—MAJOR J. A. MORRISON, D.S.O.—G. C. WATERS, Burcombe Manor, near Salisbury.

**C.**—ITCHEN BREEDING STOCK FARM, LTD.

**CLASS 144.** *Pair of Hampshire Down Ram Lambs, dropped in 1920.* [14 entries.]

**I. (£10.)**—V. T. THOMPSON, Norton Manor, Sutton Scotney, Hants

**II. (£5.)**—TRUSTEES OF THE LORD WANDSWORTH AGRICULTURAL COLLEGE. Long Sutton, near Winchfield, Hants.

**III. (£2.)**—MRS. B. A. L. JERVOISE, Herriard Park, Basingstoke, Hants.

**R.**—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading Berks.

**H.C.**—SIR G. COOPER, BART., Hursley Park, Winchester.—J. GOLDSMITH, Blendworth, Horndean.—G. C. WATERS, Burcombe Manor, near Salisbury.

**C.**—E. T. JUDD, Cocum, Sutton Scotney, Hants.—A. C. KING, Braishfield Manor, Romsey.

(Classes 145, 148 and 149 were confined to Breeders who had not previously exhibited at the Royal, Bath and West or Royal Counties Shows.)

**CLASS 145.**—*Novice Class—Pen of three Hampshire Down Ram Lambs, dropped in 1920.* [9 entries.]

**I. (£8.)**—V. T. THOMPSON, Norton Manor, Sutton Scotney, Hants.

**II. (£4.)**—L. EDMUNDS, Cholderton, Salisbury.

**III. (22.)**—E. KENWARD, Nutley Manor, Basingstoke.

**R.**—ITCHEN BREEDING STOCK FARM, LTD., Itchen Abbas, by Winchester, bred by P. Nerinckx. Itchen Down Farm, Itchen Abbas.

**C.**—H. MORRISON, M.P., Fonthill, Salisbury, Wilts.—M. N. TORY, Spettisbury, Blandford.

**CLASS 146.**—*Pen of three Hampshire Down Shearling Ewes*  
[5 entries.]

**I. (210.)**—MRS. B. A. L. JERVOISE, Herriard Park, Basingstoke, Hants

**II. (25.)**—SIR G. COOPER, BART., Hursley Park, Winchester.

**III. (22.)**—V. T. THOMPSON, Norton Manor, Sutton Scotney, Hants, bred by Lieut.-Col. A. G. Troup, Dogdean, Salisbury.

**R.**—V. T. THOMPSON, bred by A. E. Blackwell, Chipperfield, King's Langley, Herts.

**CLASS 147.**—*Pen of three Hampshire Down Ewe Lambs, dropped in*  
1920. [13 entries.]

**I. (210.)**—V. T. THOMPSON, Norton Manor, Sutton Scotney, Hants.

**II. (25.)**—TRUSTEES OF THE LORD WANDSWORTH AGRICULTURAL COLLEGE, Long Sutton, Winchfield, Hants.

**III. (22.)**—MRS. B. A. L. JERVOISE, Herriard Park, Basingstoke.

**R.**—G. C. WATERS, Burcombe Manor, near Salisbury.

**V.H.C.**—E. T. JUDD, Cocum, Sutton Scotney, Hants.

**H.C.**—J. GOLDSMITH, Blendworth, Horndean, Hants.

**C.**—THE HON. LADY HULSE, Breamore House, Breamore, Hants. --MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, Berks.

**CLASS 148.**—*Novice Class. Pen of three Hampshire Down Ewe*  
*Lambs, dropped in 1920.* [11 entries.]

**I. (28.)**—V. T. THOMPSON, Norton Manor, Sutton Scotney, Hants.

**II. (24.)**—ITCHEN BREEDING STOCK FARM, LTD., Itchen Abbas, by Winchester, bred by P. Nerinckx, Itchen Down Farm, Itchen Abbas.

**III. (22.)**—E. KENWARD, Nutley Manor, Basingstoke.

**R.**—M. N. TORY, Spettisbury, Blandford.

**H.C.**—WORT & WAY, 37, Castle Street, Salisbury.

**C.**—C. D. WOODROW, Stratford-sub-Castle, Salisbury.—C. D. WOODROW.

### CHAMPION PRIZE.

*Best Pen of Lambs in Classes 143, 144, 145, 147 or 148.*

**I. (210.)**—V. T. THOMPSON, Norton Manor, Sutton Septney, Hants.

**R.**—V. T. THOMPSON.

**liv** *Prizes awarded to Hampshire Down and Oxford Down Sheep.*

**CLASS 149.**—*Novice Class. Pen of three Hampshire Down Ewe Togs which had been in the possession of the Exhibitor for three months previous to the Show, to be shown in their wool—not housed—untrimmed with the exception of their heads and tails.* [12 entries.]

**I. (£8.)**—W. DATE, Stratford Tony, Salisbury.

**II. (£6.)**—W. DATE.

**III. (£4.)**—M. N. TORY, Spettisbury, Blandford.

**IV. (£2.)**—C. STANFORD, Breamore, Hants.

**R.**—H. R. HARDING, Britford, Salisbury.

**H.C.**—MAJOR E. W. F. CASTLEMAN, Chelth, Blandford

**C.**—H. R. HARDING.—W. J. WARREN, Charlton-All-Saints, Salisbury, bred by Major Garton, Clarendon Park, Salisbury.

**OXFORD DOWN.**

**CLASS 150.**—*Oxford Down Shearling Ram.* [13 entries.]

**I. (£10.)**—CAPTAIN R. B. BRASSEY, M.F.H., Heythrop Park, Chipping Norton.

**II. (£5.)** W. TREVETHAN, Hill House Farm, Northleach, Glos.

**III. (£2.)**—CAPTAIN R. B. BRASSEY, M.F.H.

**R.**—W. TREVETHAN.

**H.C.**—THE HON. F. G. MORGAN, Boughrood Castle, Llyswen, Breconshire, bred by H. Akers & Co., Black Bourton, Oxford. — C. S. J. WAKEFIELD, Langford Downs, Lechlade.

**C.**—THE HON. F. G. MORGAN.—C. S. J. WAKEFIELD.—C. S. J. WAKEFIELD.

**CLASS 151.** *Pair of Oxford Down Ram Lambs, dropped in 1920.* [5 entries.]

**I. (£10.)**—H. AKERS & Co., Moat House, Black Bourton, Clonfield, Oxon.

**II. (£5.)**—C. S. J. Wakefield, Langford Downs, Lechlade.

**III. (£2.)**—H. AKERS & Co.

**CLASS 152.**—*Pen of three Oxford Down Shearling Ewes.* [7 entries.]

**I. (£10.)**—CAPTAIN R. B. BRASSEY, M.F.H., Heythrop Park, Chipping Norton.

**II. (£5.)**—W. TREVETHAN, Hill House Farm, Northleach, Glos.

**III. (£2.)**—F. A. BROWN, Bourton Hill House, Moreton-in-Marsh, bred by Lord Southampton, Idlicote, Warwickshire.

**R.**—THE HON. F. G. MORGAN, Boughrood Castle, Llyswen, Breconshire.



(The Prizes in Class 153 were given by the Oxford Down Sheep Breeders' Association and were withheld until the Animals awarded the Prizes were registered in the Flock Book.)

**CLASS 153.**—*Pair of Oxford Down Ewe Lambs, dropped in 1920.*  
[3 entries.]

- I. (26.)**—H. AKERS & CO., Moat House, Black Bourton, Clanfield, Oxon.
- II. (23.)**—W. R. GANTLETT & SON, Manor Farm, Fairford, Glos.
- III. (21.)**—C. S. J. WAKEFIELD, Langford Downs, Lechlade.

### DORSET HORN.

**CLASS 154.**—*Dorset Horn Shearling Ram.* [1 entry.]

- I. (210.)**—F. P. BROWN, Kingston Farm, Chillerton, Isle of Wight.

**CLASS 155.**—*Pair of Dorset Horn Ram Lambs, dropped after November 1st, 1919.* [2 entries.]

- I. (210.)**—E. G. HEAL, Newclose, Thorly, Isle of Wight.
- II. (25.)**—F. P. BROWN, Kingston Farm, Chillerton, Isle of Wight.

**CLASS 156.**—*Pen of three Dorset Horn Shearling Ewes.* [2 entries.]

- I. (210.)**—C. MORRIS, Highfield Hall, St. Albans.
- II. (25.)**—F. P. BROWN, Kingston Farm, Chillerton, Isle of Wight.

(The Prizes in Class 157 were given by the Dorset Horn Sheep Breeders' Association.)

**CLASS 157.**—*Pen of three Dorset Horn Ewe Lambs, dropped after November 1st, 1919.* [2 entries.]

- I. (210.)**—E. G. HEAL, Newclose, Thorly, Isle of Wight.
- II. (25.)**—F. P. BROWN, Kingston Farm, Chillerton, Isle of Wight.

### DORSET DOWN.

(The Prizes in Class 158 were given by the Dorset Down Sheep Breeders Association.)

**CLASS 158.**—*Dorset Down Shearling Ram.* [10 entries.]

- I. (210.)**—HOOPER BROS., Newburgh Farm, Winfrith, Dorset.
- II. (25.)**—T. R. SPILLER, Luccombe Farm, Milton Abbas, Blandford.
- III. (22.)**—R. N. TORY, Anderson Manor Farm, Blandford, Dorset.
- V.H.C.**—R. TORY, Charisworth Manor, Blandford.
- H.C.**—SIR E. HAMBRO, K.C.V.O., Milton Abbey, Dorset.

**Ivi**    *Prizes awarded to Dorset Down and Exmoor Horn Sheep.*

**CLASS 159.**—*Pair of Dorset Down Ram Lambs, dropped in 1920.*  
[8 entries.]

**I. (210.)**—R. TORY, Charisworth Manor, Blandford.

**II. (25.)**—R. TORY.

**III. (22.)**—T. R. SPILLER, Luccombe Farm, Milton Abbas, Blandford.

**V.H.C.**—T. R. SPILLER.

**H.C.**—HOOPER BROS., Newburgh Farm, Winfrith, Dorset.

**CLASS 160.**—*Pen of three Dorset Down Shearling Ewes.* [8 entries.]

**I. (210.)**—R. N. TORY, Anderson Manor Farm, Blandford, Dorset.

**II. (25.)**—T. R. SPILLER, Luccombe Farm, Milton Abbas, Blandford.

**III. (22.)**—HOOPER BROS., Newburgh Farm, Winfrith, Dorset.

**V.H.C.**—SIR E. HAMBRO, K.C.V.O., Milton Abbey, Dorset.

**CHAMPION PRIZE.**

*Best Exhibit in Classes 158 to 160.*

**I. (25.)**—HOOPER BROS., Newburgh Farm, Winfrith, Dorset.

**R.**—R. N. TORY, Anderson Manor Farm, Blandford, Dorset.

**EXMOOR HORN.**

(The Prizes in Class 161 were given by the Exmoor Horn Sheep Breeders' Society.)

**CLASS 161.**—*Exmoor Horn Ram, Two Shear and upwards.*  
[5 entries.]

**I. (210.)**—J. HARRIS, Wistland Pound, Kentisbury, Barnstaple, Devon, bred by J. and O. Robins, Lydcott Hall, High Bray, South Molton, Devon.

**II. (25.)**—J. AND O. ROBINS, Lydcott Hall, High Bray, South Molton, Devon.

**III. (22.)**—EXORS. OF THE LATE H. K. LETHBRIDGE, Wood, Okehampton, Devon, bred by T. C. Pearce, Leigh, Dulverton, Somerset.

**R.**—C. SANDELL, Director Ministry of Agriculture and Fisheries, Amesbury Farm Settlement, Ratfyn, Amesbury, bred by A. C. Young, Watergate House, Bulford, Wilts.

**CLASS 162.**—*Exmoor Horn Shearling Ram.* [1 entry.]

**I. (210.)**—J. AND O. ROBINS, Lydcott Hall, High Bray, South Molton, Devon.

**CLASS 163.—*Pen of three Exmoor Horn Shearling Ewes.* [4 entries.]**

**I. (£10.)**—J. AND O. ROBINS, Lydcott Hall, High Bray, South Molton, Devon.

**II. (£5.)**—C. SANDELL, Director Ministry of Agriculture and Fisheries, Amesbury Farm Settlement, Rattyn, Amesbury.

**III. (£2.)**—EXORS. OF THE LATE H. K. LETHBRIDGE, Wood, Okehampton, Devon.

**R.**—C. SANDELL.

---

## PIGS.

### BERKSHIRE.

(£4 towards the Prizes in Classes 164 to 167 were given by the British Berkshire Society.)

**CLASS 164.—*Berkshire Boar, farrowed in 1917, 1918 or 1919.* [8 entries.]**

**I. (£7.)**—W. H. PALMER, Stoke's Farm, Wokingham, Berks, **Murrell Prince** (20332), born 29th June, 1917; s Minley King (18364), d Murrell Primrose (19580), s d Whitley Longfellow (18699).

**II. (£3.)**—H. R. BEETON, Hammonds, Checkendon, Reading, **Carry On**, born 2nd September, 1917, bred by J. Ismay, Iwerne Minster, Blandford; s Hurry On (19635), d Iwerne Megan (19637), s d Iwerne Lad 2nd.

**III. (£2.)**—J. ISMAY, Iwerne Minster, Blandford, **Highclere Hero** (21401), born 13th April, 1918, bred by Lord Carnarvon, Highclere Park, Highclere; s Iwerne Hare Hill (19169), d Highclere Grace (19602), s d Highclere Postmaster (18444).

**R. & H.C.**—MRS. JERVOISE, Herriard Park, Basingstoke, **Herriard Premier** 2nd, born 8th March, 1919; s Pygmalion, d Primula, s d Velmore Bill 4th.

**CLASS 165.—*Pair of Berkshire Boars, farrowed in 1920.* [10 entries.]**

**I. (£5.)**—H. R. BEETON, Hammonds, Checkendon, Reading, born 3rd January, bred by R. B. Vincent, Waterston Manor, Dorchester; s Murrell Premier (21570), d Compton Maggie (22270).

**II. (£2.)**—B. OPPENHEIMER, Sefton Park, Stoke Poges, Bucks, born 2nd January; s Sefton Hercules (21746), d Lothian Bud (20052), s d Manse of Goldicote (18665).

**III. (£1.)**—MRS. JERVOISE, Herriard Park, Basingstoke, born 26th January; s Manor Masterman, d Herriard Ophelia, s d Moundsmere Major.

**R. & H.C.**—MRS. OAKES, Graslaw House, Exeter, born 13th January; s Iwerne Paymaster (21283), d Link's Pansey (19490), s d Kingston Marmaduke (18619).

**CLASS 166.—*Berkshire Breeding Sow, farrowed before 1920.***  
[15 entries.]

**I. (27.)**—MRS. JERVOISE, Herriard Park, Basingstoke, **Herriard Primula 2nd**, born 8th March, 1919; s Pygmalion, d Primula, s d Velmore Bill 4th.

**II. (23.)**—W. H. PALMER, Stokes Farm, Wokingham, Berks, **Murrell Lassie** (19975), born 20th May, 1917; s Minley King (18364), d Murrell Lass (18935), s d Minley Champion (17122).

**III. (22.)**—J. ISMAY, Iwerne Minster, Blandford, **Compton Maggie** (22270), born 1st September, 1918, bred by R. B. Vincent, Waterston, Dorchester; s Moundsmere Warrior (17564), d Compton Gloss (20186), s d Manor Baronet (18978).

**R. & H.C.**—MRS. JERVOISE, **Herriard Primula 3rd**, born 8th March, 1919; s Pygmalion, d Primula, s d Velmore Bill 4th.

**CLASS 167.—*Pair of Berkshire Breeding Sows, farrowed in 1920.***  
[11 entries.]

**I. (25.)**—J. ISMAY, Iwerne Minster, Blandford, born 2nd January, bred by R. B. Vincent, Waterston, Dorchester; s Murrell Premier (21570), d Compton Mildred (22272).

**II. (22.)**—H. R. BEETON, Hammonds, Checkendon, Reading, born 3rd January, bred by R. B. Vincent, Waterston Manor Farm, Dorchester; s Murrell Premier, d Compton Maggie.

**III. (21.)**—MRS. OAKES, Graslaw House, Exeter, born 13th January; s Iwerne Paymaster (21283), d Links Pansey (19490), s d Kingston Marmaduke (18619).

**R. & H.C.**—B. OFFENHEIMER, Sefton Park, Stoke Poges, Bucks, born 21st January; s Jamaica Prince (20133), d Swinton Princess Daphne (20164), s d Swinton Peel's Prize (19751).

**SPECIAL PRIZE.**

GIVEN BY THE BRITISH BERKSHIRE SOCIETY.

*Best Boar or Sow in the Berkshire Classes entered in, or eligible for, the Herd Book, whose Sire and Dam, together with the name of its Breeder, are entered in the Catalogue.*

**CHAMPION PRIZE.**

GIVEN BY MRS. JERVOISE, HERRIARD PARK, BASINGSTOKE.

*A Cup, value £5 5s., for the Winner of the British Berkshire Society's Special Prize.*

**I.**—W. H. PALMER, Stoke's Farm, Wokingham, Berks, **Murrell Prince** (20332), born 29th June, 1917; s Minley King (18364), d Murrell Primrose (19580), s d Whitley Longfellow (18699).

**R.**—MRS. JERVOISE, Herriard Park, Basingstoke, **Herriard Primula 2nd**, born 8th March, 1919; s Pygmalion, d Primula, s d Velmore Bill 4th.

**LARGE BLACK.**

**CLASS 168.—***Large Black Boar, farrowed in 1917, 1918 or 1919.*  
[10 entries.]

**I. (£7.)**—H. E. BASTARD, Tinten Manor, St. Tudy, Cornwall. **Trevisquite Padstonian** (7973), born 28th November, 1917, bred T. Warne, Trevisquite, St. Mabyn; s Boss of the Valley (13855), d Trevisquite Content 8th (13470).

**II. (£3.)** MISS KAY-MOUAT, The Firs Farm, Malvern Wells, **Ratby Handyman 4th** (7591), born 16th July, 1917, bred by H. J. Freeman, Burton Fields, Burton, Hastings; s Brent Handyman (5423), d Swardston Lorna Doone (13124), s d Sudbourne Bixley (3565).

**III. (£2.)** S. F. EDGE, Gallop's Homestead, Ditchling Sussex, **Vahan King Max 1st** (10931), born 2nd June, 1919; s Vahan Max (6993), d Vahan Queen Melba (20642), s d Vahan Melva 2nd (5691).

**R.** J. CURRIE, Upham House, Aldbourne, **Clowance Prince** bred by J. Olver, Woodland Valley, Cornwall.

**H.C.** LORD PIRRIE, K.P., P.C., Witley Park, Godalming, Surrey, **Witley Gay Lad** (11725), born 11th February, 1919; s Vahan Biddy Boy, d Vahan Dolly (16376).

**CLASS 169.—***Pair of Large Black Boars, farrowed in 1920.* [8 entries.]

**I. (£5.)** T. F. HOOLEY, Dry Drayton, near Cambridge, born 20th January; s Cornwood Tartar (8851), d Drayton Primsie 1st (23308), s d Cornwood Jack (6633).

**II. (£2.)**—W. J. WARREN, Deacon's Farm, Staplegrove, Taunton. **Kibbear 4th and 5th**, born 12th January; s Bassingbourn Squire (9053), d Kibbear Lady Allies (17244), s d Drayton Disappointment 2nd (4573).

**III. (£1)** S. F. EDGE, Gallop's Homestead, Ditchling, Sussex **Vahan King Max 3rd and 4th**, born 2nd January; s Vahan Max (6993), d Vahan Queen Melba (20642), s d Vahan Melva 2nd (5691).

**R.** H. C. VENNING, Willett, Bicknoller, Taunton, **Willett Daylight** and **Willett Nightlight**, born 4th January; s Hasketon Monarch 10th, d Willett Dimpsey, s d Primley Helgarth.

**V.H.C.** MISS KAY-MOUAT, The Firs Farm, Malvern Wells, **McHeather Carlo 8th and 9th**, born 8th January; s Ratby Handyman 4th (7591), d Newland Coquette (20400), s d Docking Don Juan (6563).

**CLASS 170.—***Large Black Breeding Sow, farrowed before 1920.*  
[9 entries.]

**I. (£7.)**—T. F. HOOLEY, Dry Drayton, near Cambridge, **Tinten Black Bess 22nd**, born 15th May, 1918, bred by H. Bastard, Tinten Manor, St. Tudy, Cornwall; s Tinten Masterpiece 2nd (6381), d Tinten Black Bess 20th (17236), s d Boss of the Valley (3855).

**II. (£3.)**—A. D. LAURIE, Homefield, Sevenoaks, Kent, **Maxwelltown Lassie 3rd** (17828), born August, 1915; s Docking Victor (4385), d Cornwood Lass 46th (11954), s d Henley Victor (2947).

**III. (22).—**W. J. WARREN, Deacon's Farm, Staplegrove, Taunton, **Kibbear Lady Allies** (17244), born 6th May, 1916; s Drayton Disappointment 2nd (4573), d Kibbear Lady Annie (14050), s d Cornwood Magistrate (4271).

**R.—**S. F. EDGE, Gallop's Homestead, Ditchling, Sussex, **Vahan Queen 2nd** (15514), born 18th January, 1915; s Hasketon Lux 19th (3745), d Queen of the Valley (7984), s d The Prior (1427).

**V.H.C.—**S. F. EDGE, **Vahan Hominy** (15524), born 15th February, 1915; s Valley Happy Boy (3515), d Hasketon Malthouse 6th (11386), s d Iford Dreadnought (3245).

(The Prizes in Class 171 and the Champion Prize were given by the Large Black Pig Society.)

**CLASS 171.—***Large Black Breeding Sow, not exceeding 12 months old on May 1st 1920.* [8 entries.]

**I. (27).—**J. H. GLOVER, Delaware Farm, Cornwood, South Devon, **Tinten Ladylike**, born 8th May, 1919, bred by H. E. Bastard, Tinten Manor, St. Tudy, Cornwall; s Cornwood King John (8271), d Tinten Black Bess 20th, (17236), s d Tinten Black Bess 18th (13696).

**II. (23.)** S. F. Edge, Gallop's Homestead, Ditchling, Sussex, **Vahan Queen 3rd** (30648), born 2nd May, 1919; s Vahan Max (6993), d Vahan Queen 2nd (15514), s d Hasketon Lux 19th (3745).

**V.H.C.—**MISS KAY-MOAT, The Firs Farm, Malvern Wells, **McHeather Lace 5th** (32674), born 23rd June, 1919; s Ratby Handvman 4th (7591), d McHeather Lassie 4th (18694), s d Ratby Morton Lad (6345).

**CLASS 172.** *Pair of Large Black Breeding Sows, farrowed in 1920.* [9 entries.]

**I. (25).—**H. E. BASTARD, Tinten Manor, St. Tudy, Cornwall, born 2nd January; s Cornwood King John (8271), d Tinten Black Bess 21st (17238), s d Boss of the Valley (3855).

**II. (22).—**S. F. EDGE, Gallop's Homestead, Ditchling, Sussex, **Vahan Queen Hominy 1st and 2nd**, born 2nd January; s Cornwood Vahan Wonder (7185), d Vahan Hominy (15524), s d Valley Happy Boy (3515).

**III. (21).—**F. R. MOSER, Broadley, Sway, Hants, born 25th January; s Tartar Khan (7155), d Broadley Frisk (13730), s d Hasketon Hostage (4287).

**R.—**S. F. EDGE, **Vahan Queen Bellona 1st and 2nd**, born 2nd January; s Vahan King Melva, d Drayton Bellona (14668), s d Drayton Disappointment (4573).

**V.H.C.—**W. J. WARREN, Deacon's Farm, Staplegrove, Taunton, **Kibbear Ladys Allies 3rd and 4th**, born 12th January; s Bassingbourn Squire (9053), d Kibbear Lady Allies (17244), s d Drayton Disappointment 2nd (4573).

## CHAMPION PRIZE.

### *Best Animal in Classes 168 to 172.*

**I. (25 5s.).**—J. H. GLOVER, Delaware Farm, Cornwood, South Devon, **Tinten Ladylike**, born 8th May, 1919, bred by H. E. Bastard, Tinten Manor, St. Tudy, Cornwall; s Cornwood King John (8271), d Tinten Black Bess 20th (17236), s d Tinten Black Bess 18th (13696).

**R.**—H. E. BASTARD, Tinten Manor, St. Tudy, Cornwall, **Trevisquite Padstonian** (7973), born 28th November, 1917, bred by T. Warne, Trevisquite, St. Mabyn; s Boss of the Valley (13855), d Trevisquite Content 8th (13470).

## LARGE WHITE.

**CLASS 173.**—*Large White Boar, farrowed in 1917, 1918, or 1919.*  
[5 entries.]

**I. (27.)**—W. WHITE & SONS, Pool Farm, Taunton, Somerset **Copped Hall Clonsman** (23735), born 10th January, 1918, bred by E. J. Wythes, Copped Hall, Epping, Essex; s Walton Emperor (21459), d Copped Hall Clorissa (46642), s d Worsley Turk 70th.

**II. (23.)**—R. P. HAYNES, Delves Green Farm, Wednesbury, **Lion Heart of Caldmore** (Vol. xxxvi), born 17th July, 1918, bred by J. Chivers & Son, Ltd., Histon, Cambridge; s Histon Lion Heart (22901), d Histon Amy (53900), s d Roger of Prestwick (20195).

**III. (22.)**—LIEUT.-COL. SIR R. RANKIN, BART., Bryngwyn, Wormelow, Hereford, **Emperor of Worsley 11th**, born 1918, bred by Sir G. Greenall, Bart., C.V.O., Walton Hall, Cheshire.

**R.**—POPPIE, TUBBS & DORE, The Hollies, Great North Road, Potter's Bar, Middlesex, **Turk of Bourne** (24701), born 7th January, 1918, bred by Earl Brownlew, Belton Park, Grantham, Lincolnshire; s Turk of Belton (21411), d Belton Beauty 6th (43694), s d Mollington Jay of Bottesford (10965).

**CLASS 174.**—*Pair of Large White Boars, farrowed in 1920.* [1 entry.]

**I. (25.)**—THE WELLINGTON LIVE STOCK CO., LTD., Coolham, Shipley, Sussex, born 10th January; s Turk of Tendring (22849), d Tockwith Princess 2nd (Vol. xxxv), s d Bourne Bandmaster (18397).

## CHAMPION PRIZE.

GIVEN BY THE NATIONAL PIG BREEDERS' ASSOCIATION.

### *A Gold Medal for the best Boar in Class 173 or 174.*

**I.**—W. WHITE & SONS, Pool Farm, Taunton, Somerset, **Copped Hall Clonsman** (23735), born 10th January, 1918, bred by E. J. Wythes, Copped Hall, Epping, Essex; s Walton Emperor (21459), d Copped Hall Clorissa (46642), s d Worsley Turk 70th.

**R.**—R. P. HAYNES, Delves Green Farm, Wednesbury, **Lion Heart of Caldmore** (Vol. xxxvi), born 17th July, 1918, bred by J. Chivers & Son, Ltd., Histon, Cambridge; s Histon Lion Heart (22901), d Histon Amy (53900), s d Roger of Prestwick (20195).

## lxii *Prizes awarded to Large White and Middle White Pigs.*

CLASS 175.—*Large White Breeding Sow, farrowed before 1920.*  
[5 entries.]

**I. (27.)**—R. P. HAYNES, Delves Green Farm, Wednesbury, **Caldmore Miss Hollingsworth** (49204), born 2nd January, 1915; s Bridegroom of Bouene (15991), d Miss Hollingsworth (41740), s d Mollington Jay of Bottesford (10965).

**II. (23.)**—THE WELLINGTON LIVE STOCK CO., LTD., Coolham, Shipley, Sussex, **Marvel of Tockwith**, born 4th July, 1917, bred by E. Tomlinson, Tockwith; s Spalding Turk 9th (21317), d Spalding Lady Mollington 2nd (39230), s d Wonder 2nd (15459).

**III. (22.)**—J. A. M. POPPLE, The Hollies, Great North Road, Potter's Bar, Middlesex, **Castlethorp Beauty**, born 1st September, 1917; s Bourne Bar None (20847), d Empress of Bourne 17th (46922), s d Worsley Empress.

CLASS 176.—*Pair of Large White Breeding Sows, farrowed in 1920.*  
[2 entries.]

**I. (25.)**—THE WELLINGTON LIVE STOCK CO., LTD., Coolham, Shipley, Sussex, born 12th January; s Turk of Tendring (22849), d Bushes Pride, s d Bottesford Emperor 10th (19743).

### CHAMPION PRIZE.

GIVEN BY THE NATIONAL PIG BREEDERS' ASSOCIATION.

*A Gold Medal for the best Sow in Class 175 or 176.*

**I.**—R. P. HAYNES, Delves Green Farm, Wednesbury, **Caldmore Miss Hollingsworth** (49204), born 2nd January, 1915; s Bridegroom of Bouene (15991), d Miss Hollingsworth (41740), s d Mollington Jay of Bottesford (10965).

**R.**—THE WELLINGTON LIVE STOCK CO., LTD., Coolham, Shipley, Sussex, **Marvel of Tockwith**, born 4th July, 1917, bred by E. Tomlinson, Tockwith; s Spalding Turk 9th (21317), d Spalding Lady Mollington 2nd (39230), s d Wonder 2nd (15459).

### MIDDLE WHITE.

CLASS 177.—*Middle White Boar, farrowed in 1917, 1918, or 1919.*  
[6 entries.]

**I. (27.)**—I. L. JAMES, Beecherof, Stafford, **Beechcroft Godfather**, born 3rd January, 1919; s Reveller of Rickerscote (25523), d Wharfedale Successful (Vol. xxxvi), s d Wharfedale Corporal (19539).

**II. (23.)**—R. P. HAYNES, Delves Green Farm, Wednesbury, **First of Caldmore** (Vol. xxxvi), born 4th August, 1918, bred by C. and E. Stephenson, Burton House, Stafford; s Peter Pan (25489), d Wharfedale Romance (51906), s d Wharfedale Irresistible (21815).

**III. (22.)**—J. H. HOLLAND, Peene House, Newington, Folkestone, Kent, **Peene Reveller 2nd**, born 28th June, 1919; s Boaz of Peene (25169), d Peene Peaceful 1st (51732), s d Bardolf Warrior.



**R.**—W. T. B. CARTRIDGE, Sidbury, Worcester. **Pendley Prince** (25485), born 25th February, 1918, bred by J. G. Williams, Pendley, Tring, Herts: s Hammond's of Park Hill (19427), d Queen of Pendley (51788), s d Prestwood Bugler 3rd (20567).

**V.H.C.**—THE WELLINGTON LIVE STOCK CO., LTD., Coolham, Shipley, Sussex, born 27th April, 1919; s Histon Halo (25339), d Histon Lady 2nd (45654), s d Shrewsbury.

CLASS 178.—*Pair of Middle White Boars, farrowed in 1920.*  
[6 entries.]

**I. (25.)**—DR. M. J. ROWLANDS, Nash Farm, Keston, Kent, born 4th January; s Albany Shrewsbury (25120), d Mabel of Keston (Vol. xxxvi).

**II. (22.)**—S. F. EDGE, Gallop's Homestead, Ditchling, Sussex, **Albany King Shrewsbury 1st and 2nd**, born 3rd January: s Shrewsbury of Albany (21777), d Albany Fuschia (51234), s d Bookham Venture (21637).

**III. (21.)**—I. L. JAMES, Beechcroft, Stafford, born 18th January: s Prestwood Acrobat 1st (23197), d Midlothian Glossy (56946), s d Wharfedale Custodian 2nd (23279).

**R.**—THE WELLINGTON LIVE STOCK CO., LTD., Coolham, Shipley, Sussex, born 8th January: s Pendley King, d Histon Royal Lady, s d Bookham of Harthay (19369).

### CHAMPION PRIZE.

GIVEN BY THE NATIONAL PIG BREEDERS' ASSOCIATION.

*A Gold Medal for the best Boar in Class 177 or 178.*

**I. I. L. JAMES**, Beechcroft, Stafford, **Beechcroft Godfather**, born 3rd January, 1919: s Reveller of Rickerscote (25523), d Wharfedale Successful (Vol. xxxvi), s d Wharfedale Corporal (19539).

**R.**—R. P. HAYNES, Delves Green Farm, Wednesbury. **First of Caldmore** (Vol. xxxvi), born 4th August, 1918, bred by C. and E. Stephenson, Burton House, Stafford: s Peter Pan (25489), d Wharfedale Romance (51906), s d Wharfedale Irresistible (21815).

CLASS 179.—*Middle White Breeding Sow, farrowed before 1920.*  
[6 entries.]

**I. (27.)**—THE WELLINGTON LIVE STOCK CO., LTD., Coolham, Shipley, Sussex. **Histon Fragrance** (Vol. xxxvi), born 24th July, 1918, bred by J. Chivers, Histon: s Bookham of Harthay (19369), d Histon Violet 2nd (48434), s d Shrewsbury (19511).

**II. (23.)**—J. H. HOLLAND, Peene House, Newington, Folkestone, Kent, **Peene Peach**, born 24th May, 1919: s Boaz of Peene (25169), d Bardolf Pride 2nd (42656).

**III. (22.)**—H. R. BEETON, Hammonds, Chechendon, Reading. **Histon Pride 4th**, born 6th March, 1918, bred by J. Chivers, Histon, Cambridge: s Bookham of Harthay (19369), d Perfection's Pride (40036), s d Holywell Tetrathan.

## **lxiv Prizes awarded to Middle White & Gloucestershire Old Spots Pigs.**

**R.**—LIEUT.-COLONEL H. S. CLAY, M.P., Ford Manor, Lingfield, Surrey, **Queen of Eden Bridge**, born 16th January, 1918, bred by J. G. Williams, Pendley Manor, Tring; s Histon of Pendley (23111), d Grace of Hammond (51466).

**H.C.**—J. H. HOLLAND, **Peene Peace 1st**, born 28th June, 1919; s Boaz of Peene (25169), d Peene Peaceful 1st (51732), s d Bardolf Warrior.

**CLASS 180.**—*Pair of Middle White Breeding Sows, farrowed in 1920.*  
[7 entries.]

**I. (25.)**—S. F. EDGE, Gallop's Homestead, Ditchling, Sussex, **Albany, Fuschia 16 and 17th**, born 3rd January; s Shrewsbury of Albany (21777), d Albany Fuschia (51234), s d Bookham Venture (21637).

**II. (22.)**—I. L. JAMES, Beechcroft, Stafford, born 16th January; s Prestwood Acrobat 1st (23179), d Prestwood Pansy 7th (57164), s d Prestwood Bugler 4th (23201).

**III. (21.)**—DR. M. J. ROWLANDS, Nash Farm, Keston, Kent, born 13th January; s Albany Shrewsbury (25129), d Prestwood Prolific (57174).

**R.**—THE WELLINGTON LIVE STOCK CO., LTD., Coolham, Shipley, Sussex, born 5th January; s Pendley King, d Histon Lady Gracious, s d Shrewsbury (19511).

**V.H.C.**—J. H. HOLLAND, Peene House, Newington, Folkestone, Kent, born 16th January; s Peene Shrewsbury (Vol. xxxvi), d Manor Claretta of Peene, s d White Eagle (23299).

## **CHAMPION PRIZE.**

**GIVEN BY THE NATIONAL PIG BREEDERS' ASSOCIATION.**

*A Gold Medal for the best Sow in Class 179 or 180.*

**I.**—THE WELLINGTON LIVE STOCK CO., LTD., Coolham, Shipley, Sussex, **Histon Fragrance** (Vol. xxxvi), born 24th July, 1918, bred by J. Chivers, Histon; s Bookham of Harthay (19369), d Histon Violet 2nd (48434), s d Shrewsbury (19511).

**R.**—J. H. HOLLAND, Peene House, Newington, Folkestone, Kent, **Peene Peach**, born 24th May, 1919; s Boaz of Peene (25169), d Bardolf Pride 2nd (42656).

## **GLoucestershire Old Spots.**

(£15 towards the Prizes in Classes 181 to 184 and the Champion Prizes were given by the Gloucestershire Old Spots Pig Society).

**CLASS 181.**—*Gloucestershire Old Spots Boar, farrowed in 1917, 1918, or 1919.* [10 entries.]

**I. (27.)**—R. H. HOLE, Clapcote, Grittleton, Chippenham, **Kitesnest Jester**, born 25th March, 1918, bred by F. H. Rea, Kitesnest, Wootton-under-Edge; s Coleshill Bradley (240), d Kitesnest Judy 2nd (717), s d Bradley Pride (132).

**II. (23.)**—THE EARL OF BERKELEY, Berkeley Castle, Gloucestershire, **Berkeley Jehu** (G.O.S.P.S.B., Vol. vi), born 1st March, 1919; s Berkeley Noble (445), d Berkeley Jane 5th (2751), s d Woodlands Julian (214).

**III. (22).—**CAPTAIN R. B. BRASSEY, M.F.H., Heythrop Park, Chipping Norton, Oxon, **Winterbourne Blanco** (483), born February, 1917, bred by H. Matthews, Winterbourne, Bristol; s Winterbourne Captain (121), d Winterbourne Blanche (28).

**R.—**TYTHERINGTON FARMS, LTD., Tytherington, Heytesbury, Wilts, **Cotswold Conspirator**, born 8th May, 1919, bred by J. A. Bloss, Bourton-on-the-Water, Gloucestershire; s Berkeley Jules (448), d Cotswold Fairy 12th, s d Neston Newsmen (160).

**V.H.C.—**G. W. WESTON, Haxted House, Edenbridge, Kent, **Forthay Duke** 13th (1510), born May, 1919, bred by A. Jones; s Coleshill Bradley (240), d Forthay Favourite Duchess 9th (1236), s d Berkeley Juggler (165).

**H.C.—**J. H. RENNIE, Langstone, near Newport (Mon.), **Winterbourne Marquis**, born 16th August, 1919, bred by H. Matthews, Winterbourne, near Bristol; s Yate Prince (1516), d Brook Duchesse (2614).

**C.—**T. L. MARTIN, Ashe Warren, near Overton, Hants, **Patchway Botha**, born 12th February, 1919, bred by G. Wilkins, Woodlands Grange, near Bristol; s Chadfield Botha, d Patchway May, s d Collingwood Jumbo.—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, Berks, **Dumbleton Ben** (2076), born 12th April, 1919, bred by A. D. Willcox, Raymeadow, Dumbleton, Evesham; s Cowley Gambler 5th (841), d Dumbleton Miss 2nd (10165), s d Dumbleton Spot (2074).

**CLASS 182.—***Pair of Gloucestershire Old Spots Boars, farrowed in 1920.*  
[15 entries.]

**I. (25).—**R. H. HOLE, Clapcote, Grittleton, Chippenham, born 19th January; s Kitesnest Jester (881), d Clapcote Lirinda (813), s d Clapcote Lad (10).

**II. (22).—**F. G. BELL, Huntingford Farm, Charfield, Glos., born 10th January; s Clevehill Actor (664), d Kitesnest Susie (2612), s d Coleshill Bradley (240).

**III. (21).—**W. G. WILLIAMS, Coleshill Home Farm, near Highworth, Wilts, **Coleshill Ringleader 1st and 2nd**, born 22nd February; s Gilslake Marquis (1413), d Coleshill Countess 6th, s d Watermoor Tom (454).

**R.—**BLINMAN AND CANDY, Farrington Gurney, **Ston Easton Hero 1st and Ston Easton Hero 2nd**, born 14th February, bred by H. J. Candy, Ston Easton; s Walcombe Hero 2nd (738 Vol. v), d Ston Easton Belle (2118 Vol. v).

**V.H.C.—**F. H. REA, Kitesnest Farm, near Wotton-under-Edge, Glos., born 2nd January; s Clevehill Actor (664), d Kitesnest Judy 2nd, s d Bradley Pride (132).

**H.C.—**R. A. BENNETT AND A. H. S. HOWARD, Quarry Farm, Thornbury, Glos., **Thornbury Bo'sun** and **Thornbury Bowsprit** (Vol. vi., G.O.S.S.B.), born 17th January; s Gilslake Admiral (907), d Thornbury Bella (2676), s d Oaklands Bonnie (210).—J. H. THOMAS, Cudleigh Court, Spetchley, Worcester, born 5th January; s Winterbourne Son, d Gilslake Duchess 2nd, s d Woodlands Jumbo.

**C.—**A. W. TROTMAN, Langston Court, Newport, Mon., **Langston Gold** and **Langston Gauntlett**, born 15th January; s Berkeley Nimrod (522), d Langston Star (Vol. v), s d Gilslake Duke (156).

**CLASS 183.—*Gloucestershire Old Spots Breeding Sow, farrowed before 1920.* [29 entries.]**

**I. (27).—**W. G. WILLIAMS, Coleshill Home Farm, near Highworth, Wilts, **Coleshill Countess**, born 21st July, 1918; s Kitesnest Recruiter (221), d Portbury Emily 5th (356), s d Woodland's King (68).

**II. (23).—**BLINMAN AND CANDY, Farrington Gurney, **Winterbourne Miss Blanche**, born February, 1916, bred by H. Matthews, Winterbourne: s Winterbourne King (25), d Winterbourne Blanche (28).

**III. (22).—**A. R. KIRBY, Fawley, near Hereford, **Ideal** (3851, Vol. vi), born 18th April, 1919; s Gilslake Major, d Wye Tulip (1743, Vol. v), s d Chalfield General (237).

**R.—**R. A. BENNETT AND A. H. S. HOWARD, Quarry Farm, Thornbury, Glos., **Thornbury Jane** (Vol. vi, G.O.S.S.B.), born March, 1919, bred by W. Poole, Watchoak, Thornbury, Glos.; s Battleborough Prince (627), d Watchoak Betty (4926).

**V.H.C.—**MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, Berks, **Basildon Sceptre 1st** (2359), born 12th May, 1918; s Rajah of Hollywood Tower (455), d Bagborough Spot 32nd (1012), s d Woodlands Warrior (78).—W. G. WILLIAMS, **Coleshill Duchess** (1379), born 18th September, 1917; s Kitesnest Recruiter (221), d Portbury Emily 4th (355), s d Woodland's King (68).

**H.C.—**R. A. BENNETT AND A. H. S. HOWARD, **Thornbury Bea** (1167), born 17th July, 1917; s Forthay Prince (104), d Thornbury Beatrice (61).—W. W. and J. DOUGLAS, 142, Hanham Road, Kingswood, Bristol, **Woodstock Favourite**, born 4th February, 1918, bred by J. Douglas, 142, Hanham Road, Kingswood, Bristol; s Failand Hero, d Yate Aster, s d Failand King.—A. R. KIRBY, **Wye Cherry** (3843), born 6th May, 1919; s Gilslake Major, d Wye Perfect (1936, Vol. v), s d Chalfield General (237).—THE WELLINGTON LIVE STOCK CO., LTD., Coclham, Shipley, Sussex, **Oakleaze Ella** (1814), born 30th January, 1918, bred by A. J. Price, Oakleaze, Berkeley: s Woodland's Julian (214), d Oakleaze Cora (540), s d Berkeley Jupiter (54).

**C.—**W. W. AND J. DOUGLAS, **Woodstock Alice**, born 20th February, 1919, bred by J. Douglas, 142, Hanham Road, Kingswood, Bristol: s Shipway Prince, d Yate Fern 2nd, s d Kitesnest Recruit.—H. FRANCIS & SON, Summerleaze, East Knoyle, Salisbury, **Dorset Beauty** (4741), born 9th May, 1919; s Bagborough Charm 25th (696), d Dorset Bess, s d Dorset Boy.—R. H. HOLE, Clapcote, Grittleton, Chippenham, **Clapcote Lopear** (5284), born 28th July, 1919; s Kitesnest Jester (881), d Clapcote Lirinda (813), s d Clapcote Lad (10).—J. H. PERRETT, Hill House, Old Sodbury, Glos., **Oakland's Mabel 5th** (2076), born 7th May, 1918, bred by H. C. Baker, Oaklands, Almondsbury, Glos.; s Nutgrove Edward (92), d Oaklands Nancy 2nd (654), s d Woodland's Jumbo (71).—J. H. RENNIE, Langston, near Newport, **Gwent Ada** (1552), born 2nd January, 1918; s Gilslake Duke (156), d Winterbourne Miss Blanche (726), s d Winterbourne King (25).

**CLASS 184.—*Pair of Gloucestershire Old Spots Breeding Sows, farrowed in 1920.* [17 entries.]**

**I. (25).—**UNIVERSITY OF BRISTOL RESEARCH STATION, Long Ashton, Bristol, **Ashton Countess** and **Ashton Crystal**, born 12th January: s Daglingworth Prince (1122), d Hobwell Daisy (3088), s d Coleshill Monarch (464).

**II. (£2.)**—F. H. REA, Kitesnest Farm, near Wotton-under-Edge, Glos., born 2nd January: s Clevehill Actor (664), d Kitesnest Judy 2nd, s d Bradley Pride (132).

**III. (£1.)**—J. H. THOMAS, Cudleigh Court, Spetchley, Worcester, born 26th January: s Cleve Hill Actor, d Gilslake Duchess 3rd, s d Oakland's Hero.

**R.** R. H. HOLE, Grittleton, Chippenham, born 23rd January: s Kitesnest Jester (881), d Clapcote Lavinia (900), s d Clapcote Lad (10).

**V.H.C.**—W. W. AND J. DOUGLAS, 142, Hanham Road, Kingswood, Bristol, **Woodstock Camelia** and **Woodstock Caroline**, born 5th February, bred by J. Douglas, 142, Hanham Road, Kingswood, Bristol: s Walcombe Hero 2nd, d Yate Fern 2nd, s d Kitesnest Recruit.—W. G. WILLIAMS, Coleshill Home Farm, near Highworth, Wilts, **Coleshill Countess 17th** and **18th**, born 3rd March: s Ithells Dreadnought, d Coleshill Duchess (1379), s d Kitesnest Recruiter (221).

**C.**—BLISMAN AND CANDY Farrington Guernsey, **Ston Easton Betty 1st** and **Ston Easton Betty 2nd**, born 14th February, bred by H. J. Candy, Ston Easton: s Walcombe Hero 2nd (738 Vol. v), d Ston Easton Belle (2118, Vol. v).—G. W. WESRON, Haxted House, Edenbridge, Kent, **Haxted Belle** and **Haxted Betty**, born 2nd January: s Gilslake Major (622), d Clivehill Lassie (2719) s d Shipway Prince (284).

### *CILAMPION PRIZES.*

*The "Sir George Watson" Challenge Cup, value £21, for the best animal in Classes 181 to 184. (The Cup to be won three times by the same Exhibitor with different animals before becoming his own property.)*

**I.**—W. G. WILLIAMS, Coleshill Home Farm near Highworth, Wilts, **Coleshill Countess**, born 21st July, 1918: s Kitesnest Recruiter (221), d Portbury Emily 5th (356), s d Woodland's King (68).

**R.**—R. H. HOLE, Clapcote, Grittleton, Chippenham **Kitesnest Jester**, born 25th March, 1918, bred by F. H. Rea, Kitesnest, Wotton-under-Edge: s Coleshill Bradley (240), d Kitesnest Judy 2nd (717), s d Bradley Pride (132).

*The "Deane-Drummond" Cup, value £14 14s., for the best Boar in Class 181 or 182. (The Cup to be won twice by the same Exhibitor with different animals before becoming his own property.)*

**I.**—R. H. HOLE, Clapcote, Grittleton, Chippenham **Kitesnest Jester**, born 25th March, 1918, bred by F. H. Rea, Kitesnest, Wotton-under-Edge: s Coleshill Bradley (240), d Kitesnest Judy 2nd (717), s d Bradley Pride (132).

**R.**—THE EARL OF BERKELEY, Berkeley Castle, Gloucestershire, **Berkeley Jehu** (G.O.S.P.S.B., Vol. vi), born 1st March, 1919: s Berkeley Noble (445) d Berkeley Jane 5th (2751), s d Woodlands Julian (214).

*The "Hiatt Baker" Champion Cup for the best Sow in Class 183 or 184. (The Cup to be won twice by the same exhibitor with different animals before becoming his own property.)*

**I.**—W. G. WILLIAMS, Coleshill Home Farm, near Highworth, Wilts, **Coleshill Countess**, born 21st July, 1918; s Kitesnest Recruiter (221), d Portbury Emily 5th (356), s d Woodland's King (68).

**R.**—UNIVERSITY OF BRISTOL RESEARCH STATION, Long Ashton, Bristol, **Ashton Countess** and **Ashton Crystal**, born 12th January: s Daglingworth Prince (1122), d Hobwell Daisy (3088), s d Coleshill Monarch (464).

### WESSEX SADDLEBACK.

(£20 towards the Prizes in Classes 185 to 188 were given by the Wessex Saddleback Pig Society.)

**CLASS 185.**—*Wessex Saddleback Bour, farrowed before 1920. [7 entries.]*

**I. (27.)**—T. L. MARTIN, Ashe Warren House, near Overton, Hants, **Ashe Plant**, born September, 1918, bred by V. Hacker, Glebe Farm, Sherfield English, Hants; s Melchet Cooper No. 2, d Sherfield Susie, s d Melchet Cooper No. 2.

**II. (23.)**—E. RALLS, Romsey, Hants, **Cattistock Best Born**, born 4th April, 1919; s Caer Kingmaker, d Cattistock Bracelet.

**III. (22.)**—MISSSES F. E. DONISTHORPE AND G. DE MONTGEON, Eastington Hall, Upton-on-Severn, **Eastington Nimrod** (81, Vol. ii), born 15th April, 1919.

**R.**—MISSSES F. E. DONISTHORPE AND G. DE MONTGEON, **Eastington Simba** (127 Vol. ii) born 4th July, 1919, bred by F. E. Donisthorpe, Eastington Hall, Upton-on-Severn; d Eastington Fearsome (275).

**H.C.**—RIGHT HON. SIR A. MOND. BART., Melchet Court, near Romsey, Hants, **Duke of Britain** (63), bred by H. Hitchins; s Norman Hero (27).

**CLASS 186.**—*Wessex Saddleback Boar, farrowed in 1920. [8 entries.]*

**I. (25.)**—E. RALLS, Romsey, Hants, **Cattistock Deputy Master**, born 20th January; s Clipper of Brighstone, d Cattistock Ridgway.

**II. (22.)**—W. J. MALDEN, Overton, Hants, **Oakley Beatty**, born 23rd January, bred by V. Hacker, Sherfield English, near Romsey; s Cattistock Norman, d Sherfield Susie, s d Melchet Cooper.

**III. (21.)**—W. J. MALDEN, **Oakley Haig**, born 23rd January, bred by V. Hacker, Sherfield English, near Romsey; s Cattistock Norman; d Sherfield Susie, s d Melchet Cooper No. 2.

**R.**—G. R. SOUTHWELL, Holbury Farm, Lockerley, Romsey, **Leader**, born 19th February; s Norman Hero (27), d Holbury Lassie (101).

**H.C.**—G. R. SOUTHWELL, **Lancer**, born 19th February; s Norman Hero (27), d Holbury Lassie (101).

**CLASS 187.—*Wessex Saddleback Breeding Sow, farrowed before 1920.***  
[12 entries.]

**I. (27).—**RIGHT HON. SIR A. MOND, BART., Melchet Court, Romsey, Hants, **Melchet Winter** (1), born 1917, bred by E. Winter, Glebe Farm, Landford, near Salisbury.

**II. (23).—**E. RALLS, Romsey, Hants, **Cattistock Ridgway**, born April, 1919, bred by C. Cross, Romsey, Hants.

**III. (22).—**SIR W. G. WATSON, BART., Sulhamstead House, near Reading, **Kennet Beauty**, born 1918, bred by J. Attrill, Brighstone, Isle of Wight; s Duke of Brighstone, d Pride of Brighstone.

**R.—**MISSSES F. E. DONISTHORPE AND G. DE MONTGEON, Eastington Hall, Upton-on-Severn, **Eastington Darke Ladye** (270), born 15th April, 1919.

**V.H.C.—**T. L. MARTIN, Ashe Warren House, Overton, Hants, **Ashe Mercy**, born September, 1918, bred by V. Hacker, Glebe Farm, Sherfield English, near Romsey; s Melchet Cooper No. 2, d Sherfield Susie. s d Melcher Cooper No. 2.

**H.C.—**MISSSES F. E. DONISTHORPE AND G. DE MONTGLON, **Eastington Lady Godiva** (268), born 7th April, 1919.—W. J. MALDEN, Overton, Hants, **Oakley Mary**, born September, 1918, bred by V. Hacker, Glebe Farm, Sherfield English, Romsey; s Melchet Cooper No. 2, d Sherfield Susie, s d Melchet Cooper No. 2.—RIGHT HON. SIR A. MOND, BART., **Norman Nitrate**, born 23rd March, 1919, bred by W. M. G. Singer, Norman Court, Salisbury; s Norman Hero (27), d Norman Empress (45).

**CLASS 188.—*Pair of Wessex Saddleback Breeding Sows, farrowed in 1920.*** [3 entries.]

**I. (25).—**SIR W. G. WATSON, BART., Sulhamstead House, near Reading, **Kennett Beauty 1st and 2nd**, born 3rd January; s Cattistock Nipper, d Kennet Beauty s d Pride of Brighstone.

**GOLD MEDALS.**

GIVEN BY MISS F. DONISTHORPE, EASTINGTON HALL,  
UPTON-ON-SEVERN.

*Best Exhibit in Class 185 or 187.*

**I.—**RIGHT HON. SIR A. MOND, BART., Melchet Court, Romsey, Hants, **Melchet Winter** (1), born 1917, bred by E. Winter, Glebe Farm, Landford, near Salisbury.

**R.—**T. L. MARTIN, Ashe Warren House, near Overton, Hants, **Ashe Plant**, born September, 1918, bred by V. Hacker, Glebe Farm, Sherfield English, Hants; s Melchet Cooper No. 2, d Sherfield Susie, s d Melchet Cooper No. 2.

**lxx Prizes awarded to Wessex Saddleback Pigs and for Cider.**

GIVEN BY THE WESSEX SADDLEBACK PIG SOCIETY.

*Best Pig exhibited in Class 186 or 188, the exhibitor to select the animal in Class 188 to compete.*

**I.**—E. RALLS, Romsey, Hants, **Cattistock Deputy Master**, born 20th January ; s Clipper of Brighstone, d Cattistock Ridgway.

**R.**—SIR W. G. WATSON, BART., Sulhamstead House, near Reading, **Kennet Beauty 1st and 2nd**, born 3rd January : s Cattistock Nipper, d Kennet Beauty, s d Pride of Brighstone.

## PRODUCE.

### CIDER.

(Open to Growers or Makers.)

**CLASS 189.**—*Cask of not less than 18 and not more than 30 gallons of Cider, made in 1919, of a specific gravity not exceeding 1.015 at 60° Fahr. [8 entries.]*

**I. (#3.)**—H. J. DAVIS.

**II. (#2.)**—H. J. DAVIS.

**III. (#1.)**—PULLIN BROS.

**R.**—RIDLEE & SON.

**H.C.**—J. M. PARRY & Co.

**C.**—TILLEY BROS.

**CLASS 190.**—*Twelve bottles of Cider, made in 1919, of a specific gravity not exceeding 1.015 at 60° Fahr. [9 entries.]*

**I. (#3.)**—H. J. DAVIS.

**II. (#2.)**—TILLEY BROS.

**III. (#1.)**—H. J. DAVIS.

**R.**—J. M. PARRY & Co.

**H.C.**—PULLIN BROS.

**C.**—TILLEY BROS.

**CLASS 191.**—*Cask of not less than 18 and not more than 30 gallons of Cider, made in 1919. [8 entries.]*

**I. (#3.)**—H. J. DAVIS.

**II. (#2.)**—J. M. PARRY & Co.

**III. (#1.)**—TILLEY BROS.

**R.**—TILLEY BROS.



CLASS 192.—*Twelve Bottles of Cider, made in 1919.* [13 entries.]

- I. (£3.)—RIDLER & SON.
- II. (£2.)—RIDLER & SON.
- III. (£1.)—J. M. PARRY & CO.
- R.—H. J. DAVIS.
- H.C.—TILLEY BROS.

CLASS 193.—*Twelve Bottles of Cider, made in any year previous to 1919.*  
[4 entries.]

- I. (£3.)—H. J. DAVIS.
- II. (£2.)—W. D. LANE.
- III. (£1.)—RIDLER & SON.
- R.—H. J. DAVIS.

#### BOTTLED FRUIT.

(The Prizes in Classes 194 and 195 were given by the Wiltshire County Council and competition was confined to persons who had attended the Wilts County Council Lectures or Classes.)

CLASS 194.—*Fruits in water only. Six bottles of any size containing not less than three varieties, Rhubarb being admitted.* [9 entries.]

- I. (£1 5s.)—MISS M. BECKETT.
- II. (£1.)—MISS F. LEWIS.
- III. (15s.)—H. H. MILLS.
- IV. (10s.)—MISS R. LUMSDEN.
- R.—A. W. HOPKINS.

CLASS 195.—*Fruits in water, in syrup, or pulped. Either or all three methods may be used. Six bottles of any size containing not less than three varieties, Rhubarb and Tomatoes being admitted.*  
[3 entries.]

- I. (£1 5s.)—H. H. MILLS.

#### CHEESE.

CLASS 196.—*Three Cheddar Cheeses (not less than 56lbs. each), made in 1919.* [4 entries.]

- I. (£10.)—E. HUNT.
- II. (£7.)—A. STONE & SON.
- R.—H. E. TUCKER.

CLASS 197.—*Three Cheddar Cheeses (not over 56lbs. each) made in 1919.* [4 entries.]

**I. (28.)**—H. A. BUTLER.

**II. (25.)**—H. E. TUCKER.

**R.**—A. J. P. PONTING.

CLASS 198.—*Three Single Gloucester or Wilts Cheeses, made in 1919.*  
*First prize, £6—second, £4—third, £2.*

[NO ENTRY.]

CLASS 199.—*Eight Loaf or other Truckle Cheeses, made in 1919.*  
[7 entries.]

**I. (25.)**—E. PADFIELD

**II. (23.)**—H. H. PICKFORD.

**III. (22.)**—H. E. TUCKER.

**H.C.**—J. W. BANWELL.

**C.**—A. STONE & SON.

CLASS 200.—*Three Caerphilly Cheeses, made in 1920.* [10 entries.]

**I. (25.)**—WILTS UNITED DAIRIES.

**II. (23.)**—MISS A. SYMONS.

**V.H.C.**—A. F. SOMERVILLE.

**C.**—MISS E. KNIGHT.

(The Prizes in Class 201 were given by the Wiltshire County Council.)

CLASS 201.—*Three Small Cheeses, made by a Student of the Wilts County Cheese Classes.* [26 entries.]

**I. (23.)**—MISS C. K. CLARKE.

**II. (22.)**—W. COLLETT.

**III. (21.)**—MISS E. H. FRAY.

**H.C.**—G. E. ISAAC.

### CREAM CHEESE, BUTTER AND CREAM.

(These Classes were not open to Professional Teachers.)

CLASS 202.—*Three Cream or other Soft Cheeses.* [9 entries.]

**I. (23.)**—BENNETT AND HOWARD.

**II. (22.)**—MISS L. A. BARKER.

**III. (21.)**—LADY A. FORBES.

**R.**—MISS E. KNIGHT.

**CLASS 203.—3lbs. of Fresh (or very slightly salted) Butter. [32 entries.]**

- I. (24.)**—MRS. W. HOWARD PALMER.  
**II. (23.)**—MRS. J. WAY.  
**III. (22.)**—A. F. SOMERVILLE.  
**IV. (21.)**—MISS V. M. ARTHURS.  
**R.**—MRS. C. WYNN.  
**V.H.C.**—MISS L. A. BARKER.  
**H.C.**—MAJOR J. A. MORRISON, D.S.O.

(The Prizes in Class 204 were given by the Wiltshire County Council.)

**CLASS 204.—3lbs. of Fresh (or very slightly salted) Butter, made by a Student of the Wilts County Butter School or Classes. [16 entries.]**

- I. (23.)**—MISS F. BAKER.  
**II. (22.)**—MRS. W. HARDING.  
**III. (21.)**—MISS F. A. LEWIS.  
**IV. (10s.)**—CAPTAIN D. GRAHAM.

**CLASS 205.—3lbs. of Butter, in the making of which no salt had been used, to be judged on the last day of the Show. [17 entries.]**

- I. (24.)**—A. F. SOMERVILLE.  
**II. (23.)**—MAJOR J. A. MORRISON, D.S.O.  
**III. (22.)**—MRS. W. HOWARD PALMER.  
**IV. (21.)**—S. G. ASHER.

**CLASS 206.—Not less than 6lbs. of Fresh Butter, packed for Transit—First prize, £3—second, £1 10s.—third, 10s.**

[No ENTRY.]

**CLASS 207.—12lbs. of Keeping Butter, in a jar or crock, delivered to the Secretary four weeks before the Show. [7 entries.]**

- I. (24.)**—MRS. W. HOWARD PALMER.  
**II. (23.)**—A. F. SOMERVILLE.  
**III. (22.)**—CAPTAIN HON. SIR J. WARD, BART., K.C.V.O.  
**R.**—R. FORTUNE.

**CLASS 208.—Four half-pounds of Scalded Cream. [4 entries.]**

- I. (23.)**—W. BEER.  
**II. (22.)**—H. B. BLACKBURN.  
**R.**—MRS. W. R. BEER.

## COMPETITIONS.

## BUTTER-MAKING.

(The Prizes in Classes 210, 212 and 214 were given by the Wiltshire County Council and competition in them was confined to Students who had received instruction in the Wilts County Butter School or Classes.)

**CLASS 209.**—*For first year Students who had been through a course of instruction in Butter-making at any County Council School since the Society's last Show. On the second day of the Show.* [8 entries.]

**I. (£4.)**—MISS L. A. BARKER.

**II. (£3.)**—MISS E. M. AYLES.

**III. (£1 10s.)**—MISS D. DEWDNEY.

**R.**—MISS A. SPENCER.

**C.**—MISS C. A. FRANCIS.—MISS E. E. KNIGHT.—MISS A. TILLEY.—MISS M. WILLIAMS.

**CLASS 210.**—*For Wilts County Council Students, on the second day of the Show.*— [11 entries.]

**I. (£3.)**—MISS F. BAKER.

**II. (£1 10s.)**—MISS A. WHITE.

**III. (£1.)**—MISS M. BRINSON.

**IV. (10s.)**—MISS A. SOUTHEY.

**R.**—MRS. F. M. CLARK.

**CLASS 211.**—*For Men and Women, on the third day of the Show.* [19 entries.]

**I. (£4.)**—MISS P. E. JACKSON.

**II. (£3.)**—MRS. M. POOLEY.

**III. (£1 10s.)**—MISS E. M. PRICE.

**IV. (£1.)**—MRS. MILES.

**H.C.**—MRS. A. GULLIVER.—MISS J. JAMES.—MISS R. JAMES.—MISS D. E. NICHOLAS.—MISS A. SPENCER.

**C.**—MISS D. DEWDNEY.

**CLASS 212.**—*For Wilts County Council Students, on the third day of the Show.* [10 entries.]

**I. (£3.)**—MISS E. BEAUCHAMP.

**II. (£1 10s.)**—MISS A. WHITE.

**III. (£1.)**—MISS W. S. POULTON.

**IV. (10s.)**—MISS E. M. CLARKE.

**R.**—MISS C. K. CLARKE.

**CLASS 213**—*For Men and Women, on the fourth day of the Show.*  
[16 entries.]

**I. (£4.)**—MRS. A. GULLIVER.

**II. (£3.)**—MISS J. JAMES.

**III. (£1 10s.)**—MRS. MILES.

**IV. (£1.)**—MISS R. JAMES.

**V.H.C.**—C. J. CLARK.—MISS D. E. NICHOLAS.—MISS J. PRITCHARD.

**H.C.**—MISS A. SPENCER.

**CLASS 214.**—*For Wilts County Council Students, on the fourth day of the Show.* [11 entries.]

**I. (£3.)**—C. J. CLARK.

**II. (£1 10s.)**—MISS E. HAYDEN.

**III. (£1.)**—CAPTAIN D. GRAHAM.

**IV. (10s.)**—J. F. DEAN.

**CLASS 215.**—*For Winners of First and second Prizes in the Butter-making Classes 209 to 214, or at any previous meeting of the Society. On the fifth day of the Show.* [7 entries.]

**I. (Gold Medal).**—MISS J. PRITCHARD.

**II. (Silver Medal).**—MISS R. JAMES.

**III. (Bronze Medal).**—MISS J. JAMES.

**R.**—MRS. A. GULLIVER.

**MILKING.**

**CLASS 216.**—*For Men, 17 years of age and over.* [9 entries.]

**I. (£1 10s.)**—G. F. CRYER.

**II. (£1.)**—C. LANDER.

**III. (15s.)**—W. J. HARDING.

**R.**—F. DIMMER.

**V.H.C.**—J. W. BEWSEY.

**H.C.**—H. ALLEN.—H. H. JACKSON.

**CLASS 217.**—*For Women, 17 years of age and over.* [17 entries.]

**I. (£1 10s.)**—MRS. F. PENTON.

**II. (£1.)**—MISS E. KELLY.

**III. (15s.)**—MISS F. M. KING.

**IV. (10s.)**—MISS W. E. LLOYD.

**V.H.C.**—MRS. MILES.

**H.C.**—MISS M. K. CLIFFORD.—MISS I. H. LIVINGSTONE.

**C.**—MISS E. BOWDEN.—MISS D. E. NICHOLAS.

**CLASS 218.—*For Boys and Girls under 17 years of age* [10 entries.]**

- I. (£1 10s.)**—MISS M. J. BRACHER.
- II. (£1.)**—MISS E. DIMMER.
- III. (15s.)**—A. PENTON.
- R.**—M. NEWMAN.
- V.H.C.**—B. DIMMER. G. HARRISON.
- C.**—E. C. NEWMAN.—N. G. NEWMAN.

**SHOEING.**

(The Prizes in Classes 220, 222 and 225 were given by the Wiltshire County Council, and competition was confined to persons who had attended the Wiltshire County Farriery Classes.)

**CLASS 219.—*Cart Horse Shoeing, by Smiths 18 years of age and over on the day of competition, who had not previously won the First Prize in a corresponding Class at one of the Society's Meetings, or a Championship Prize at any National or County Agricultural Society's Show, at 10 a.m. on the 2nd day of the Show.*** [18 entries.]

- I. (£4.)**—W. PRICE, R.S.S.
- II. (£3.)**—J. H. BAKER, JUN.
- III. (£2.)**—T. FELTHAM, A.F.C.L.
- IV. (£1.)**—J. HEMMINGS, R.S.S.
- R. & V.H.C.**—FARR-STAFF-SERGT. J. C. PRICE, R.A.V.C.
- V.H.C.**—F. R. WHITEHORN, R.S.S.
- H.C.**—A. E. FELTHAM.—J. D. G. HARRIS, A.F.C.L.
- O.**—SERGT. E. BROWN.

**CLASS 220.—*Cart Horse Shoeing (Students' Class), at 2 p.m. on the 2nd day of the Show.*** [5 entries.]

- I. (£3.)**—T. MERRITT, R.S.S.
- II. (£1 10s.)**—T. FELTHAM, A.F.C.L.
- III. (£1.)**—A. E. FELTHAM.
- IV. (10s.)**—E. F. FELTHAM.
- R.**—W. U. WHITE.

**CLASS 221.—*Nag Horse Shoeing, by Smiths under 18 years of age on the day of competition, ditto, ditto, at 10 a.m. on the 3rd day of the Show.—First prize, £4—second, £3—third, £2—fourth, £1.***

[NO ENTRY.]

**CLASS 222.**—*Ditto (Students' Class), at 12 noon on the 3rd day of the Show* [2 entries.]

**Equal I. (£2 5s.)**—A. E. FELTHAM.

**Equal I. (£2 5s.)**—W. U. WHITE.

**CLASS 223.**—*Shoe Making or Turning, by Smiths under 20 years of age on the day of the competition, the patterns and descriptions of the Shoes to be supplied by the Judge, at 10 a.m. on the 4th day of the Show—First prize, £4—second, £3—third, £1—fourth, 10s.*

[No ENTRY.]

**CLASS 224.**—*Shoe Making or Turning, by Smiths 20 years of age and over on the day of the competition, the patterns and descriptions of the Shoes to be supplied by the Judge, at 10 a.m. on the 4th day of the Show.* [14 entries.]

**I. (£4.)**—W. PRICE, R.S.S.

**II. (£3.)**—J. H. BAKER, JUN.

**III. (£2.)**—H. JONES.

**IV. (£1.)**—J. O. MATHIAS, R.S.S.

**R. & V.H.C.**—W. F. SAUNDERS.

**V.H.C.**—H. W. BURDEN, R.S.S.

**CLASS 225.**—*Shoe Making or Turning (Students' Class), at 2 p.m. on the 4th day of the Show.* [5 entries.]

**I. (£3.)**—J. H. MERRITT, A.F.C.L.

**II. (£1 10s.)**—T. MERRITT, R.S.S.

**III. (£1.)**—T. FELTHAM, A.F.C.L.

**IV. (10s.)**—W. U. WHITE.

**R. & V.H.C.**—A. E. FELTHAM.

## POULTRY.

(UNDER POULTRY CLUB RULES.)

(The Birds in Classes 1 to 49 must have been hatched previous to January 1st, 1920.)

CLASS 1.—ANY DISTINCT BREED, EXCEPT BANTAMS—COCK AND THREE HENS, BRED IN 1918 OR 1919 (THE PROPERTY OF ONE EXHIBITOR), MATED FOR BREEDING. [6 entries.]

I. (£3.)—J. H. BAKER & SONS, *Indian Game*.

II. (£2.)—CAPTAIN G. S. PHIPPS HORNBY, *Dorkings*

III. (£1.)—E. C. TUCKER, *Indian Game*.

R.—T. T. BATT, *Columbian Wyandottes*.

V.H.C. MISS D. A. A. KNIGHT, *Silkie*s

H.C.—MISS E. WESTON, *White Leghorns*.

CLASS 2.—COCHIN OR BRAHMA, COCK. [3 entries.]

I.—(£1.)—G. H. PROCTER.

II. (15s.)—G. LANE.

R.—H. L. POPHAM.

CLASS 3.—COCHIN OR BRAHMA, HEN. [3 entries.]

I. (£1.)—G. H. PROCTER.

II. (15s.)—H. L. POPHAM.

R.—R. P. WHEADON.

CLASS 4.—PLYMOUTH ROCK, COCK. [5 entries.]

I. (£1.)—H. SPENSLEY.

II. (15s.)—F. W. ROGERS.

R.—MRS. H. COOKE.

V.H.C.—REV. F. H. EVA.

CLASS 5.—PLYMOUTH ROCK, HEN. [4 entries.]

I. (£1.)—J. S. BRANGWYN.

II. (15s.)—J. S. BRANGWYN.

R.—F. W. ROGERS.

CLASS 6.—ORPINGTON (BUFF), COCK. [6 entries.]

I. (£1.)—W. H. COOK.

II. (15s.)—F. M. ROGERS.

III. (10s.)—F. M. ROGERS.

R.—J. WARREN.

V.H.C.—G. H. STUBINGTON.



**CLASS 7.—ORPINGTON (BUFF), HEN. [6 entries.]**

**I. (£1.)**—MAJOR J. A. MORRISON, D.S.O.

**II. (15s.)**—F. M. ROGERS. .

**III. (10s.)**—MAJOR R. J. BACON.

**R.**—MAJOR R. J. BACON.

**CLASS 8.—ORPINGTON (BLACK), COCK. [8 entries.]**

**I. (£1.)**—C. E. WOODWARD.

**II. (15s.)**—H. BRIFFETT.

**III. (10s.)**—T. C. PINNIGER.

**R.**—T. C. PINNIGER.

**CLASS 9.—ORPINGTON (BLACK), HEN. [4 entries.]**

**I. (£1.)**—C. E. WOODWARD.

**II. (15s.)** —JOHNS BROS.

**R.**—W. M. BELL.

**CLASS 10 —ORPINGTON (WHITE), COCK. [4 entries.]**

**I. (£1.)**—W. M. BELL.

**II. (15s.)**—W. M. BELL.

**R.**—W. CORY.

**CLASS 11.—ORPINGTON (WHITE), HEN. [6 entries.]**

**I. (£1.)**— W. M. BELL.

**II. (15s.)**—MAJOR R. J. BACON.

**III. (10s.)**—MAJOR R. J. BACON.

**R.**—C. E. RUSSELL.

**CLASS 12.—MINORCA, COCK. [4 entries.]**

**I. (£1.)**—FURSLED BROS.

**II. (15s.)**—A. G. PITTS.

**R.**—MAJOR R. J. BACON.

**CLASS 13.—MINORCA, HEN. [7 entries.]**

**I. £1.)**—FURSLED BROS.

**II. (15s.)**—J. L. EVANS.

**III. (10s.)**—FURSLED BROS.

**R.**—MAJOR R. J. BACON.

**V.H.C.**—A. G. PITTS.

**H.C.**—MAJOR R. J. BACON.

**C.**—J. PITMAN.

CLASS 14.—RHODE ISLAND (RED), COCK. [13 entries.]

- I. (£1.)**—REV. G. WILLIAMS.
- II. (15s.)**—J. H. BAKER & SONS.
- III. (10s.)**—MRS. W. SCHWABE.
- R.**—A. C. MAJOR.
- V.H.C.**—A. J. LUCAS.
- H.C.**—W. H. L. HURMAN.
- C.**—T. A. SCOTT & CO.

CLASS 15.—RHODE ISLAND (RED), HEN. [8 entries.]

- I. (£1.)**—T. A. SCOTT & CO.
- II. (15s.)**—J. J. LARCOMBE.
- III. (10s.)**—G. TESTER.
- R.**—W. H. L. HURMAN.
- V.H.C.**—MRS. W. SCHWABE.
- H.C.**—J. H. BAKER & SONS.
- C.**—C. E. RUSSELL.

CLASS 16.—SUSSEX, COCK. [13 entries.]

- I. (£1.)**—A. J. FALKENSTEIN.
- II. (15s.)**—MRS. M. A. GRANT.
- III. (10s.)**—MRS. M. A. GRANT.
- R.**—J. LEWIS.
- V.H.C.**—MRS. M. A. GRANT.
- H.C.**—L. H. WACE.
- C.**—S. H. PEARLESS.

CLASS 17.—SUSSEX, HEN. [17 entries.]

- I. (£1.)**—S. H. PEARLESS.
- II. (15s.)**—MRS. M. A. GRANT.
- III. (10s.)**—MAJOR J. A. MORRISON, D.S.O.
- R.**—J. LEWIS.
- V.H.C.**—MRS. M. A. GRANT
- H.C.**—S. H. PEARLESS.
- C.**—MAJOR J. A. MORRISON, D.S.O.

CLASS 18.—DORKING, COCK. [4 entries.]

- I. (£1.)**—A. C. MAJOR.
- II. (15s.)**—CAPT. G. S. PHIPPS HORNBY.
- R.**—A. C. MAJOR.
- V.H.C.**—R. ALTY.

**CLASS 19.—DORKING, HEN. [4 entries.]**

- I. (£1.)—A. C. MAJOR.**  
**II. (15s.)—R. ALTY.**  
**R.—A. C. MAJOR.**  
**V.H.C.—CAPTAIN G. S. PHIPPS HORNBY.**

**CLASS 20.—FAVEROLLES, COCK OR HEN. [4 entries.]**

- I. (£1.)—G. TOMKIN.**  
**II. (15s.)—C. H. BRADLEY.**  
**R.—C. H. BRADLEY.**

**CLASS 21.—LANGSHAM, COCK. [8 entries.]**

- I. (£1.)—J. T. GROVES.**  
**II. (15s.)—H. P. MULLENS.**  
**III. (10s.)—E. J. TAUNTON.**  
**R.—T. GRIFFITHS.**  
**V.H.C.—J. T. GROVES.**  
**H.C.—W. J. HURD.**  
**C.—E. J. TAUNTON.**

**CLASS 22.—LANGSHAN, HEN. [3 entries.]**

- I. (£1.)—E. J. TAUNTON.**  
**II. (15s.)—H. P. MULLENS.**  
**R.—E. J. TAUNTON.**

**CLASS 23.—WYANDOTTE (SILVER OR GOLD LACED), COCK. [11 entries.]**

- I. (£1.)—J. RUNDLE.**  
**II. (15s.)—J. RUNDLE.**  
**III. (10s.)—S. D. BATHARD.**  
**V.H.C.—T. C. PINNIGER.—S. AND E. WILSON.**

**CLASS 24.—WYANDOTTE (SILVER OR GOLD LACED), HEN. [6 entries.]**

- I. (£1.)—J. RUNDLE.**  
**II. (15s.)—T. C. PINNIGER.**  
**III. 10s.)—H. SPENSLEY.**  
**V.H.C.—S. AND E. WILSON.**  
**H.C.—S. D. BATHARD.—D. T. MORGANS.**

**CLASS 25 —WYANDOTTE (WHITE), COCK. [14 entries.]**

- I. (£1.)—G. TOMKIN.**  
**II. (15s.)—T. A. SCOTT & Co.**  
**III. (10s.)—F. RODDA.**  
**V.H.C.—LADY FITZGERALD.—H. P. SWANTON.**

CLASS 26.—WYANDOTTE (WHITE), HEN. [14 entries.]

I. (£1.)—MAJOR J. A. MORRISON, D.S.O.

II. (15s.)—F. RODDA.

III. (10s.)—W. CORY.

V.H.C.—F. RODDA.

H.C.—MAJOR R. J. BACON.—LADY FITZGERALD.—G. TOMKIN.

CLASS 27.—WYANDOTTE (BLACK), COCK—FIRST PRIZE, £1—  
SECOND, 15s.—THIRD, 10s.

[No ENTRY.]

CLASS 28.—WYANDOTTE (BLACK), HEN—FIRST PRIZE, £1—SECOND, 15s.—  
THIRD, 10s.

[No ENTRY.]

CLASS 29.—WYANDOTTE (ANY OTHER COLOUR), COCK. [5 entries.]

I. (£1.)—C. E. PURNELL,

II. (15s.)—T. T. BATT, *Columbian*.

V.H.C.—L. H. WACE.

CLASS 30.—WYANDOTTE (ANY OTHER COLOUR), HEN. [5 entries.]

I. (£1.)—G. TOMKIN.

II. (15s.)—L. H. WACE.

V.H.C.—T. T. BATT, *Columbian*.

H.C.—T. T. BATT.

CLASS 31 —LEGHORN (WHITE) COCK [1 entry.]

II. (15s.)—MAJOR R. J. BACON.

CLASS 32.—LEGHORN (WHITE), HEN. [6 entries.]

I. (£1.)—F. SKEY.

II. (15s.)—G. TOMKIN.

III. (10s.)—W. H. BUCKLEY.

H.C.—W. POWELL.

CLASS 33.—LEGHORN (ANY OTHER COLOUR), COCK. [3 entries.]

I. (£1.)—J. JONES.

II. (15s.)—J. JONES.

CLASS 34.—LEGHORN (ANY OTHER COLOUR), HEN. [2 entries.]

I. (£1.)—LADY COOTE.

R.—MISS E. WESTON.

CLASS 35.—HAMBURG (BLACK), COCK. [3 entries.]

I. (£1.)—W. SNELL.

II. (15s.)—H. FORTUNE.

CLASS 36.—HAMBURG (BLACK), HEN. [7 entries.]

I. (£1.)—R. P. INSALL.

II. (15s.)—H. FORTUNE.

III. (10s.)—W. H. AVERY.

V.H.C.—W. SNELL.

CLASS 37.—HAMBURG (ANY OTHER COLOUR), COCK. [5 entries.]

I. (£1.)—G. HARRIS.

II. (15s.)—W. PERKIN.

V.H.C.—H. FORTUNE.

H.C.—G. HARRIS.

CLASS 38.—HAMBURG (ANY OTHER COLOUR), HEN. [2 entries.]

I. (£1.)—H. MCFARLAND.

CLASS 39.—OLD ENGLISH GAME (BLACK RED), COCK. [2 entries.]

I. (£1.)—W. H. HAMBLETON.

CLASS 40.—OLD ENGLISH GAME (BLACK RED), HEN.—FIRST PRIZE, £1—  
SECOND, 15s.—THIRD, 10s.

[NO ENTRY.]

CLASS 41.—OLD ENGLISH GAME (ANY OTHER COLOUR), COCK. [3 entries.]

I. (£1.)—MAJOR J. A. MORRISON, D.S.O.

II. (15s.)—MAJOR J. A. MORRISON, D.S.O.

CLASS 42.—OLD ENGLISH GAME (ANY OTHER COLOUR), HEN. [3 entries.]

I. (£1.)—MAJOR J. A. MORRISON, D.S.O.

II. (15s.)—H. T. DEAN.

H.C.—MAJOR J. A. MORRISON, D.S.O.

CLASS 43.—INDIAN GAME, COCK. [5 entries.]

I. (£1.)—J. H. BAKER & SONS.

II. (15s.)—E. C. TUCKER.

H.C.—N. HARRIS.

CLASS 44.—INDIAN GAME, HEN. [4 entries.]

I. (£1.)—J. H. BAKER & SONS.

II. (15s.)—D. T. PHILLIPS.

H.C.—E. C. TUCKER.

## CLASS 45.—FRENCH (EXCLUDING FAVEROLLES), COCK. [2 entries.]

I. (£1.)—G. HENWOOD.

H.C.—G. HENWOOD.

## CLASS 46.—FRENCH (EXCLUDING FAVEROLLES), HEN. [3 entries.]

I. (£1.)—G. HENWOOD.

II. (15s.)—C. E. PURNELL.

H.C.—G. HENWOOD.

## CLASS 47.—ANY OTHER DISTINCT BREED NOT PREVIOUSLY MENTIONED, COCK. (9 entries.)

I. (£1.)—MRS. A. LATHAM, *Blue Orpington*.II. (15s.)—MAJOR J. A. MORRISON, D.S.O., *Silver Campine*.III. (10s.)—J. H. BAKER & SONS, *Malay*.V.H.C.—MRS. D. A. A. KNIGHT, *Silkie*.—R. P. WHEADON, *Black Spanish*.H.C.—ARLE POULTRY FARM, *Jubilee Indian Game*.—MRS. M. A. GRANT *Scots Grey*.—HON. I. G. GREVILLE *Blue Orpington*.—MISS E. K. A. TATHAM *Sicilian Buttercup*.

## CLASS 48.—ANY OTHER DISTINCT BREED NOT PREVIOUSLY MENTIONED, HEN. [12 entries.]

I. (£1.)—MAJOR J. A. MORRISON, D.S.O., *Blue Orpington*.II. (15s.)—MRS. M. A. GRANT, *Scots Grey*.

III. (10s.)—N. HARRIS.

V.H.C.—MISS E. K. A. TATHAM, *Sicilian Buttercup*.—R. P. WHEADON, *Black Spanish*.H.C.—MISS D. A. A. KNIGHT, *Silkie*.—A. J. LUCAS, *Blue Orpington*.

## CLASS 49.—COCK AND HEN, OF ANY PURE BREED, BEST MATED TO PRODUCE TABLE POULTRY. [5 entries.]

I. (£1.)—C. E. RUSSELL.

II. (15s.)—CAPTAIN G. S. PHIPPS HORNBY, *Dorkings*.H.C.—F. FOOT, *Indian Game Cock, Orpington Hen*.—MAJOR J. A. MORRISON, D.S.O., *Indian Game*.

## SELLING CLASSES.

## CLASS 50.—ANY DISTINCT BREED, COCK OR COCKEREL (PRICE NOT TO EXCEED £1 1s.) [5 entries.]

I. (£1.)—ARLE POULTRY FARM, *Rhode Island Red*.II. (15s.)—LADY FITZGERALD, *White Wyandotte*.R.—J. H. BAKER & SONS, *Indian Game*.V.H.C.—A. J. LUCAS, *Black Orpington*.H.C.—R. W. WHITTAKER, *White Wyandotte*.

**CLASS 51.—ANY DISTINCT BREED, HEN OR PULLET (PRICE NOT TO EXCEED £1 1s.) [5 entries.]**

- I. (21.)**—C. E. RUSSELL, *Hamburgh*.
- II. (15s.)**—J. H. BAKER & SONS, *Indian Game*.
- R.**—LADY FITZGERALD, *White Wyandotte*.
- V.H.C.**—F. FOOT, *Indian Game*.
- H.C.**—R. W. WHITTAKER, *White Wyandotte*.

**CHICKENS OF 1920.**

**CLASS 52.—COCHIN, BRAHMA, PLYMOUTH ROCK, ORPINGTON, LANGSHAN, SUSSEX OR DORKING COCKEREL, HATCHED IN 1920. [11 entries.]**

- I. (21.)**—W. H. COOK, *Sussex*, hatched January 2.
- II. (15s.)**—MAJOR J. A. MORRISON, D.S.O., *Sussex*, hatched January 1.
- III. (10s.)**—J. WARREN, hatched last week in January.
- R.**—MAJOR J. A. MORRISON, D.S.O., *Sussex*, hatched January 1.
- V.H.C.**—W. H. COOK, *Buff Orpington*, hatched January 3.
- H.C.**—J. WARREN, hatched last week in January.
- C.**—MRS. M. A. GRANT, *Light Sussex*, hatched January 10.

**CLASS 53.—COCHIN, BRAHMA, PLYMOUTH ROCK, ORPINGTON, LANGSHAM, SUSSEX OR DORKING, PULLET, HATCHED IN 1920. [12 entries.]**

- I. (21.)**—MAJOR J. A. MORRISON, D.S.O., *Sussex*, hatched January 1.
- II. (15s.)**—W. H. COOK, *Sussex*, hatched January 2.
- III. (10s.)**—MRS. M. A. GRANT, *Light Sussex*, hatched January 10.
- R.**—A. C. MAJOR, *Dorkings*, hatched January 2.
- V.H.C.**—MRS. M. A. GRANT, *Light Sussex*, hatched January 10.
- H.C.**—J. WARREN, hatched last week in January.
- C.**—S. H. PEARLESS, *Speckled Sussex*, hatched January 7.

**CLASS 54.—MINORCA, WYANDOTTE, LEGHORN, HAMBURG, FAVEROLLES OR FRENCH COCKEREL, HATCHED IN 1920. [4 entries.]**

- I. (21.)**—E. CANNING, *White Wyandotte*, hatched January 5.
- II. (15s.)**—LADY FITZGERALD, *White Wyandotte*, hatched January 5.

**CLASS 55.—MINORCA, WYANDOTTE, LEGHORN, HAMBURG, FAVEROLLES OR FRENCH PULLET, HATCHED IN 1920. [4 entries.]**

- I. (21.)**—LADY FITZGERALD, *White Wyandotte*, hatched January 5.
- II. (15s.)**—E. CANNING, *White Wyandotte*, hatched January 5.

**CLASS 56.—GAME, MALAY, OR ANY OTHER DISTINCT BREED NOT PREVIOUSLY MENTIONED. COCKEREL, HATCHED IN 1920. [8 entries.]**

- I. (21.)**—W. H. SNELL, *Modern Duckwing Game*, hatched January 2.
- II. (15s.)**—T. HAMMETT, *Malay*, hatched January 4.
- III. (10s.)**—W. H. HAMBLETON, *Black Red Game*, hatched January 21.
- V.H.C.**—J. H. BAKER & SONS, *Indian Game*, hatched January 3.

**CLASS 57.—GAME, MALAY, OR ANY OTHER DISTINCT BREED NOT PREVIOUSLY MENTIONED, PULLET. HATCHED IN 1920. [6 entries.]**

- I. (21.)**—W. H. HAMBLETON, *Wheaton Game*, hatched January 21.
- II. (15s.)**—J. H. BAKER & SONS, *Indian Game*, hatched January 3.
- III. (10s.)**—N. HARRIS, *Jubilee Indian Game*, hatched January 14.
- H.C.**—MAJOR J. A. MORRISON, D.S.O., *Silver Campine*, hatched January 1.

#### LIVE TABLE POULTRY.

**CLASS 58.—PAIR OF COCKERELS OF ANY PURE BREED, HATCHED IN 1920. [5 entries.]**

- I. (21.)**—A. C. MAJOR, *Dorkings*, hatched January 2.
- II. (15s.)**—E. C. TUCKER, *Indian Game*, hatched January 25.

**CLASS 59.—PAIR OF PULLETS OF ANY PURE BREED, HATCHED IN 1920. [7 entries.]**

- I. (21.)**—J. H. BAKER & SONS, *Indian Game*, hatched January 3.
- II. (15s.)**—MRS. M. A. GRANT, *Light Sussex*, hatched January 10.
- III. (10s.)**—A. C. MAJOR, *Dorkings*, hatched January 2.
- R.**—MRS. A. HAMBLY, *Light Sussex*, hatched January 9.
- V.H.C.**—MAJOR J. A. MORRISON, D.S.O., *Light Sussex*, hatched January 1.
- H.C.**—C. E. RUSSELL, *Wyandotte*, hatched January 2.
- C.**—E. CANNING, *White Wyandotte*, hatched January 5.

**CLASS 60.—PAIR OF CROSS-BRED COCKERELS, HATCHED IN 1920 [1 entry.]**

- I. (21.)**—LADY FITZGERALD, *Game Orpington-Sussex*, hatched January 20.

**CLASS 61.—PAIR OF CROSS-BRED PULLETS, HATCHED IN 1920. [2 entries.]**

- I. (21.)**—C. E. RUSSELL, *Wyandotte-Dorking*, hatched January 2.
- H.C.**—LADY FITZGERALD, *Indian Game-Orpington*, hatched January 20.



**SPECIAL PRIZES.**

Given by the Poultry Club.

*A Silver Medal for best Cock in the Poultry Classes, the property of a member of the Poultry Club.* I.—G. H. PROCTER.

*A Silver Medal for best Hen in the Poultry Classes, the property of a member of the Poultry Club.* I.—MAJOR J. A. MORRISON, D.S.O.

*A Silver Medal for best Cockerel in the Poultry Classes, the property of a member of the Poultry Club.* I.—T. HAMMETT, Malay, hatched January 4th.

*A Silver Medal for best Pullet in the Poultry Classes, the property of a member of the Poultry Club.* I.—J. H. BAKER & SONS, Indian Game, hatched January 3rd.

Given by the Buff Orpington Club.

*Silver Egg Cup and Spoon for the best Buff Orpington exhibited by a member of that Club.* MAJOR J. A. MORRISON, D.S.O.

**DUCKS, GEESSE AND TURKEYS.**

CLASS 62.—DRAKE OR DUCK (AYLESBURY). [2 entries.]

**II. (15s.)**—C. E. PURNELL.

**R.**—C. E. RUSSELL.

CLASS 63.—DRAKE OR DUCK (ROUEN). [3 entries.]

**I. (£1.)**—MAJOR J. A. MORRISON, D.S.O.

**III. (10s.)**—ABBOT BROS.

**R.**—W. H. HAMBLETON.

CLASS 64.—DRAKE OR DUCK (PEKIN)—FIRST PRIZE, £1—SECOND, 15s.  
THIRD 10s.

[NO ENTRY.]

CLASS 65.—GANDER OR GOOSE. [3 entries.]

**I. (£1.)**—W. F. SNELL & SONS, Emden.

**II. (15s.)**—ABBOT BROS.

**R.**—C. E. PURNELL.

CLASS 66.—TURKEY, COCK OR HEN. [4 entries.]

**I. (£1.)**—MISS F. NAGLE.

**II. (15s.)**—A. RUSSELL-SMITH.

**R.**—ABBOT BROS.

**DEAD TABLE POULTRY.***(Forwarded killed and plucked.)*

**CLASS 67.—PAIR OF COCKERELS OF 1920 OF ANY PURE BREED.**  
[2 entries.]

**I.—(£1.)—**MRS. M. A. GRANT, *Light Sussex*, hatched January 17.

**CLASS 68.—PAIR OF PULLETS OF 1920 OF ANY PURE BREED—FIRST PRIZE, £1—SECOND, 15s.—THIRD, 10s.**

[No ENTRY.]

**CLASS 69.—PAIR OF CROSS-BRED COCKERELS OF 1920.** [2 entries.]

**I. (£1.)—**MRS. M. A. GRANT, *Salmon Faverolle, Light Sussex*, hatched Jan. 31.

**R.—**MRS. C. TUCK, hatched February 10.

**CLASS 70.—PAIR OF CROSS-BRED PULLETS OF 1920.** [1 entry.]

**I. (£1.)—**MRS. M. A. GRANT, *Old English Game-Buff Orpington*, hatched January 31.

**CLASS 71.—PAIR OF DUCKLINGS OF 1920.** [2 entries.]

**I. (£1.)—**MRS. C. TUCK, hatched March 24.

**R.—**T. WEBBER, *Aylesbury-Pekin*, hatched about April 2.

*The Prizes in Class 72 were given by the Wiltshire County Council and competition was confined to persons who had attended the Wilts County Poultry Classes or Lectures.*

**CLASS 72.—PAIR OF TRUSSED FOLWS.** [2 entries.]

**I. (£1 10s.)—**A. J. LUCAS, *Indian Game Cross*.

**II. (£1 5s.)—**MRS. C. TUCK.

## Bath and West and Southern Counties Society.

### OBJECTS OF THE SOCIETY AND PRIVILEGES OF MEMBERSHIP.

#### ANNUAL EXHIBITIONS.

THE Society annually holds an Exhibition in some city or town in England or Wales. Each section of the Society's district is visited at intervals, so that most Members have an opportunity of seeing the Show in their own neighbourhood every few years. Prizes to a large amount are given for Horses, Cattle, Sheep, Pigs, Farm Produce, &c. Provision is also made for the exhibition of Agricultural Implements and Machinery, Seeds, Cattle Foods, Artificial Manures, and articles of general utility. A substantially built and completely equipped Working Dairy on a large scale is a special feature of these Exhibitions. Here explanatory demonstrations and comparative tests of implements and processes are carried on, with the assistance of well-known practical and scientific experts, and Butter-making Competitions are held. Among the features of the Annual Meeting are Shoeing, Milking and other Competitions, Poultry and Horticultural Shows, and Exhibitions illustrative of Bee-keeping, Home Industries, Manufactures, Nature Study and Forestry.

*Membership entitles to free admission to the Annual Exhibition, and also to the Grand Stand overlooking the Horse and Cattle Ring, to the Reserved Seats in the Working Dairy, and to the use of the Members' Special Pavilion for Luncheons, Reading, Writing, &c.*

*Entries can be made by Members (elected on or before the last Tuesday in January preceeding the Show, or who have paid two years subscription before the date of closing of entries), at about half the Fees payable by Non-Members.*

#### THE JOURNAL.

*All Members receive free of charge the Society's Journal, which is published annually bound in cloth. It has for its aim the dissemination of agricultural knowledge in a popular form, and, in addition to original articles by well-known agricultural authorities, it contains particulars of the Society's general operations, full reports of its experimental and research work, prize awards, financial statements, lists of Members, reviews of new books on agriculture, &c. (The price of the Journal to non-Members is 6s. 9d. post free.)*

#### CHEMICAL AND OTHER FACILITIES.

The Society has a Consulting Chemist *from whom Members can obtain analyses and reports at reduced rates of charge.* An arrangement has also been made under which Members of the Society can obtain, free of charge, from the National Fruit and Cider Institute at Long Ashton, analyses of cider-apples and perry-pears, and, with a view to assisting farmers and others in dealing with insect and other pests which affect agriculture, horticulture, &c., the Council have availed themselves of an offer from the Board of Economic Biology of the University of Bristol to investigate the nature of any insect or other pest and report upon it free of charge.

**EXPERIMENTS.**

Experiments on crops are conducted at experimental stations in various parts of the Kingdom, and *Members are enabled to take part in these and to receive reports thereon.*

**ART-MANUFACTURES, NATURE STUDY, FORESTRY, &c.**

One of the objects for which the Society was founded was the encouragement of Arts as well as Agriculture, and, to this end, exhibitions are held of Art-Manufactures and of work representative of Arts and Handicrafts. Exhibitions are also held illustrating Nature Study, as a branch of Education; the Science of Forestry, &c.

**TERMS OF MEMBERSHIP. .****ANNUAL SUBSCRIPTIONS.**

Governors, not less than	..	..	..	..	£2
Ordinary Members, not less than	..	..	..	..	£1
Tenant Farmers, the rateable value of whose holdings does					
not exceed £200 a-year, not less than				..	10s.

Governors, who are eligible for election as President or Vice-President, are entitled, in addition to the privileges already mentioned, to an extra Season Ticket for the Annual Exhibition and for the Grand Stand, &c. Governors subscribing more than £2 are entitled to a further Ticket for every additional £1 subscribed.

Members subscribing less than £1 are entitled to all the privileges of Membership except that of entering Stock at reduced fees, and their admission Ticket for the Annual Show is available for *one day only* instead of for the whole time of the Exhibition.

**LIFE COMPOSITIONS.**

Governors may compound for their Subscription for future years by payment, in advance, of £20; and Members by payment, in advance, of £10. Governors and Members who have subscribed for twenty years may become Life Members on payment of half these amounts.

Any person desirous of joining the Society can be proposed by a Member, or by

**F. H. STORR, O.B.E.,**  
Secretary and Editor.

3, Pierrepont Street, Bath.

**Telegraphic Address—"AGRICULTURE, BATH."**

**Telephone No. 610.**

# Bath and West and Southern Counties Society.

## GENERAL LAWS.

*As revised in accordance with the Report of a Special Committee; which Report was received and adopted by the Annual General Meeting of Members, held on May 30, 1895.*

## COMPOSITION OF THE SOCIETY.

I. The Society shall consist of a President, Vice-Presidents, Trustees, Council, Treasurer, Secretary, and Members.

## OBJECTS.

II. The Society shall have the following objects :—

- (a) To hold Exhibitions of breeding stock, agricultural implements, and such other articles connected with agriculture, arts, manufactures or commerce, as may be determined upon by the Council.
- (b) To conduct practical and scientific investigations in agriculture.
- (c) To promote technical education in agriculture by providing means of systematic instruction.
- (d) To publish a Journal for circulation.

## SUBSCRIPTIONS.

III. The Annual Subscription for Members shall be as follows :—

Governors (who are eligible for election as President or Vice-President), not less than .. .. .	£2
Ordinary Members, not less than .. .. .	£1
Tenant Farmers (the rateable value of whose holdings does not exceed £200 a-year), not less than .. .. .	10s.

IV. The payment of £20 in one sum shall constitute a Governor for life, and of £10 in one sum an Ordinary Member for life; but any Governor who has subscribed not less than £2 annually for a period of twenty years may become a Life Governor on the further payment of £10 in one sum: and any Ordinary Member, who has subscribed not less than £1 annually for the same period may become a Life-Member on the further payment of £5 in one sum.

V. Subscriptions shall become due and be payable in advance on the 1st of January in each year or as soon as the Subscriber has been elected a Member. When the election takes place during the last quarter of the year the subscription payable on election will be considered as applying to the ensuing year.

VI. A Member shall be liable to pay his subscription for the current year unless he shall have given notice, in writing, to the Secretary before January 1st of his intention to withdraw.

## GOVERNING BODY.

VII. The entire management of the Society—including the making of Bye-laws, election of Members, determining the Prizes to be awarded, appointing Committees, fixing the Places of Meetings and Exhibitions, appointing or removing the Treasurer, Secretary, and such other officers as may be required to carry on the business of the Society—shall be vested in the Council who shall report its proceedings at the Annual Meetings of the Society.

VIII. The Council shall consist of the Patron (if any), President, Vice-Presidents, Trustees, and Treasurer (who shall be *ex-officio* Members), and of sixty-six elected Members.

### **ELECTION OF PRESIDENT, VICE-PRESIDENTS, TRUSTEES AND COUNCIL.**

IX. The election of a President for the year, of any additional Vice-Presidents or Trustees, and of the Members of Council representing the Divisions named in Law X., shall take place at the Annual Meeting of the Society, and they shall enter into office at the conclusion of the Exhibition during which such Annual Meeting has been held.

X. The sixty-six Members of the Council referred to in Laws VIII. and IX. shall consist of fifty-eight persons residing or representing property in the following Divisions, viz. :—

Twelve from the Counties of Devon and Cornwall, which shall be called the Western Division ;

Twenty-four from the Counties of Somerset, Dorset, and Wilts, which shall be called the Central Division ;

Twelve from the Counties of Hants, Berks, Oxon, Bucks, Middlesex, Surrey, Sussex, and Kent, which shall be called the Southern Division ; and

Ten from the Counties of Worcester, Gloucester, Hereford and Monmouth, and the Principality of Wales, which shall be called the North-Western Division.

The remaining eight shall be elected (irrespective of locality) from the general body of members, and shall form a Division which shall be called the " Without Reference to District " Division.

XI. One-half of the elected Members in each of the five Divisions named in Law X. shall retire annually by rotation, but shall be eligible for re-election.

XII. The Council shall have power to nominate a President, Vice-Presidents, Trustees, and Members of Council for the approval of the Annual Meeting, and to fill up such vacancies in their own body as are left after the Annual Meeting, or as may from time to time occur during the interval between the Annual Meetings.

XIII. Nominations to offices, election to which is vested in the whole body of Members, must reach the Secretary ten days before the meeting at which such vacancies are to be filled up.

### **MEETINGS.**

XIV. The Annual Meeting of the Society shall take place during the holding of the annual Exhibition.

XV. Special General Meetings of the Society may be convened by the President on the written requisition of not less than three Members of Council ; and all Members shall have ten days' notice of the object for which they are called together,

XVI. No Member of less than three months' standing, or whose subscription is in arrear, shall be entitled to vote at a Meeting.

### **EXHIBITIONS.**

XVII. The Annual Exhibitions of the Society shall be held in different Cities or Towns in successive years.

XVIII. All Exhibitors shall pay such fees as may be fixed by the Council. Members subscribing not less than £1 per annum, who have been elected previous to February 1st, and have paid the subscription for the current year, or who pay two years subscription before the date of closing of entries, shall be entitled to exhibit at such reduction in these fees as the Council shall determine.

**PRIZES.**

XIX. All prizes offered at the cost of the Society shall be open for competition to the United Kingdom.

XX. No person intending to compete for any prize offered at the annual Exhibition shall be eligible to act as a judge or to have any voice in the selection of judges to award the premiums in the department in which he exhibits.

XXI. If it be proved to the satisfaction of the Council that any person has attempted to gain a prize in this, or in any other society, by a false certificate or by a misrepresentation of any kind, such person shall thereupon be, for the future excluded from exhibiting in this Society.

**JOURNAL.**

XXII. The Proceedings of the Society, Awards of Prizes, Financial Statements and Lists of Officers, Governors, and Members, shall be printed annually in the Society's *Journal*, and every Governor and Member, not in arrear with his subscription, shall be entitled to receive one copy, free of expense, and there shall be an additional number printed for sale.

**POLITICS.**

XXIII. No subject or question of a political tendency shall be introduced at any Meeting of this Society.

**ALTERATIONS IN LAWS.**

XXIV. No new General Law shall be made or existing one altered, added to or rescinded, except at an Annual or Special General Meeting, and then only provided that a statement of particulars, in writing, shall have been sent to the Secretary at least twenty-one days previous to the Meeting at which the question is to be considered.

## LIST OF OFFICERS,

1920-21.

### PATRON.

HIS MOST GRACIOUS MAJESTY THE KING.

### PRESIDENT.

THE RIGHT HON. THE LORD BLEDISLOE, K.B.E.

### TRUSTEES.

\*BATH, THE MARQUIS OF, K.G., Longleat, Warminster.

EDWARDS, C. L. F., The Court, Axbridge, Somerset.

SHELLEY, SIR. J., BART., Shobrooke Park, Crediton.

### VICE-PRESIDENTS.

BADCOCK, H. J. . . . .	Broadlands, Taunton
BAKER, G. E. LLOYD . . . .	Hardwicke Court, Gloucester
*BATH, MARQUIS OF, K.G. . . .	Longleat, Warminster
*BEAUFORT, DUKE OF . . . . .	Badminton, Chippenham
BENYON, J. HERBERT . . . . .	Englefield House, Reading
*BUTE, MARQUIS OF . . . . .	The Castle, Cardiff
*CLINTON, LORD . . . . .	Heanton Satchville, Dolton, N. Devon
*COVENTRY, THE EARL OF . . . .	Croome Court, Worcester
DEVONSHIRE, DUKE OF . . . . .	Chatsworth, Derbyshire
*DUCIE, EARL OF . . . . .	Tortworth, Falfield, R.S.O.
EDWARDS, C. L. F. . . . .	The Court, Axbridge, Somerset
FALMOUTH, VISCOUNT . . . . .	Tregothnan, Truro
HAMLEDEN, VISCOUNT . . . . .	Greenlands, Henley-on-Thames
HOBHOUSE, RIGHT HON. H. . . .	Hadspen House, Castle Cary
JERSEY, EARL OF . . . . .	Middleton Park, Bicester, Oxon.
*LANSDOWNE, MARQUIS OF, K.G. .	Bowood, Calne
*LLEWELYN, SIR J. T. Dt, Bart. .	Penllergaer, Swansea
MOUNT EDGCUMBE, THE EARL OF .	Mount Edgcumbe, Devonport

\*.\* Those to whose names an asterisk (\*) is prefixed have filled the office of President.



**VICE-PRESIDENTS—continued.**

NEVILLE GRENVILLE, R.	. . .	Butleigh Court, Glastonbury
NORTHUMBERLAND, DUKE OF	. . .	Albury Park, Guildford
*PLYMOUTH, EARL OF	. . .	Hewell Grange, Bromsgrove
POLTIMORE, LORD	. . .	Court Hall, North Molton, Devon
*RADNOR, THE EARL OF	. . .	Longford Castle, Salisbury
SHELLEY, SIR J., Bart	. . .	Shobrooke Park, Crediton
SILLIFANT, A. O.	. . .	Culm Leigh, Stoke Canon, Exeter
SOMERSET, DUKE OF	. . .	Maiden Bradley, Bath
STRACHIE, LORD	. . .	Sutton Court, Pensford, Somerset
TEMPLE, EARL	. . .	Newton St. Loe, Bristol

THE LORD WARDEN OF THE STANNARIES.

THE SECRETARY AND KEEPER OF THE RECORDS OF THE DUCHY OF  
CORNWALL.

THE RECEIVER-GENERAL OF THE DUCHY OF CORNWALL.

\*.\* Those to whose names an asterisk (\*) is prefixed have filled the office of President.

# MEMBERS OF COUNCIL.

## EX-OFFICIO MEMBERS.

THE PATRON.  
THE PRESIDENT.

THE VICE-PRESIDENTS.  
THE TRUSTEES.  
THE TREASURER.

## ELECTED MEMBERS.

### WESTERN DIVISION (DEVON AND CORNWALL). (12 Representatives)

Elected in 1919.		Elected in 1920.	
Name.	Address.	Name.	Address.
BOSCAWEN, REV. A. T.	Ludgvan Rectory, Long Rock, R.S.O., Cornwall	BUCKINGHAM, REV. PREB.	The Rectory, Doddlecombeleigh, Exeter
CHICHESTER, MAJOR C. H.	Hall, Bishop's Tawton, Barnstaple	GIBBS, A. H.	Pytts, Clyst St. George, Topsham, Devon
DAW, J. E.	4, Louisa Terrace, Exmouth	MOORE-STEVENS, COL. R. A.	Winscott, Torrington, Devon
LOPES, SIR HENRY Y. B., Bart.	Maristow, Roborough, South Devon	SHELLEY, J. F.	Posbury House, Crediton
MARTYN, G.	Liskeard, Cornwall	STUDDY, T. E.	Broxton, Paignton
MORLEY, EARL OF	Saltram, Plympton, Devon	WILLIAMS, JOHN	Scorrier House, Scorrier, Cornwall

### CENTRAL DIVISION (SOMERSET, DORSET, AND WILTS). (24 Representatives.)

CLARK, W. H.	Rutland Cottage, Combe Down, Bath	BEAUCHAMP, SIR F. B.	Woodboro' House, Pease-down St. John, Bath
FARWELL, Major E. W.	Hilton Estate Office, Kilmersdon, Bath	BRIDGMAN, H.	Cleeve Hill Farm, Bristol
GORDON, G. H.	The Barn House, Sherborne, Dorset	BRUFORD, R.	Nerrols, Taunton
HILL, MAJOR V. T.	Woodspring Priory, near Weston-super-Mare	FOX, R. A.	Yate House, Yate, Glos.
HOARE, SIR H. H. A., Bart.	Stourhead, Zeals, S.O., Wilts	GIBSON, J. T.	Warren House, Wrington
HURLE, J. C.	Bristolington Hill, Bristol	NAPIER, H. B.	Long Ashton, Clifton, Bristol
KNIGHT, S. J.	Buckingham Lodge, Keynasham, Bristol	NICHOLS, G.	Demerara House, Colston Avenue, Bristol
RAWLENCE, E. A.	Newlands, Salisbury	PARRY-OKEDEN, LT.-COL. U. E. P.	Turnworth, Blandford, Dorset
RAWLENCE, G. N.	Salisbury	PEARCE, T. H.	Parsonage Farm, Long Ashton, Bristol
SOMERVILLE, A. F.	Dinder House, Wells	SANDERS, LIEUT.-COL. SIR R.A., Bart., M.P.	Bayford Lodge, Wincanton
WATSON, CAPT. THE HON. T. H.	Cormiston, Milverton, Somerset	TUDWAY, C. C.	The Cedars, Wells, Somt.
WHITE, A. E., O.B.E.	Charnage, Mere, Wilts	WYNFORD, LIEUT.-COL. LORD, D.S.O.	Wynford House, Maiden Newton, Dorset

### SOUTHERN DIVISION (HANTS, BERKS, OXON, BUCKS, MIDDLESEX, SURREY, SUSSEX AND KENT). (12 Representatives.)

ASHCROFT, W.	13, The Waldrons, Croydon	ACLAND, RT. HON. F. DYKE, M.P.	93, Bedford Gardens, Campden Hill, London, W. 8
COBB, H. M.	Higham, Rochester	BEST, MAJOR T. G.	East Carleton Manor, Norwich
CUNDALL, H.M., I.S.O., F.S.A.	4, Marchmont Gardens, Richmond Hill, Surrey	JERVOISE, F. H. T.	Herrard Park, Basingstoke
DRUMMOND, H. W.	Board Room, L.&S.W.R., Waterloo Stn., London	LATHAM, T.	Dorchester, Oxon
ISMAI, J. H.	Iwerne Minster, Blandford	SUTTON, E. P. F.	Sidmouth Grange, near Reading
LLEWELLYN, CAPTAIN L. T. E.	Hackwood, Basingstoke	THOMAS-STANFORD, C.	Preston Manor, Brighton

### NORTH-WESTERN DIVISION (WORCESTERSHIRE, GLOUCESTERSHIRE, HEREFORDSHIRE, MONMOUTHSHIRE AND WALES). (10 Representatives.)

ACKERS, MAJOR C. P.	Huntley Manor, Gloucester	ALLSEBROOK, A.	Link Elm, Malvern Link
ALEXANDER, D.	Cardiff	BEST, CAPT. W.	Vivod, Llangollen
ALEXANDER, H. G.	5, High Street, Cardiff	COTTERELL, SIR J., Bart.	Garnons, Hereford
BLEDISLOE, LORD	Lydney Park, Gloucester	LIPSCOMB, G.	Margam Park Estate Office, Port Talbot
DRUMMOND, COL. F. D. W., C.B.E.	Cawdor Estate Office, Carmarthen	MASON, F. F.	Swansea

### WITHOUT REFERENCE TO DISTRICT DIVISION. (8 Representatives.)

EVANS, H. M. G.	Plasissa, Llangennech, Carmarthen	BATHURST, SIR F. H.	Somborne Park, Stockbridge, Hants
LEWIS, COL. H.	Green Meadow, near Cardiff	BUSE, W. G.	Wrexall Manor, Cattlestock, Dorset
MASTERS, A.	Kynetton, Thornbury, Glos.	MILES, LT.-COL. SIR C. W., Bart.	Charlton, Portbury, Bristol
WILLIAMS, MAJOR JESTYN	Miskin Manor, Pontyclun	STORRAR, J. I.	Tredegar Estate Office, Newport, Mon.

## STANDING COMMITTEES, 1920-1921.

[The PRESIDENT is an *ex-officio* Member of all Committees.]

### ALLOTMENT.

EDWARDS, C. L. F., *Chairman.*

BATH, MARQUIS OF, K.G.	MASON, F. F.	STUDDY, T. E.
BEST, CAPT. W.	NAPIER, H. B.	WYNFORD, LIEUT.-COL. LORD, D.S.O.

### CONTRACTS.

NAPIER, H. B., *Chairman.*

ALLSEBROOK, A.	DAW, J. E.	NEVILLE (GRENVILLE), R.
BATH, MARQUIS OF, K.G.	EDWARDS, C. L. F.	RAWLENCE, G. N.
BEST, CAPT. W.	MASON, F. F.	STUDDY, T. E.

### DAIRY.

SOMERVILLE, A. F., *Chairman.*

ASHCROFT, W.	HURLE, J. C.	NEVILLE (GRENVILLE), R.
BOSCAWEN, REV. A. T.	KNIGHT, S. J.	STRACHIE, LORD
CLARK, W. H.	LATHAM, T.	TUDWAY, C. C.
GIBBS, A. H.	LEWELLYN, I. T. E.	WHITE, A. R., O.B.E.
GIBSON, J. T.	NAPIER, H. B.	

### DISQUALIFYING.

THE STEWARDS OF LIVE STOCK AND PRODUCE.

### EXPERIMENT AND EDUCATION.

, LORD BLEDISLOE, K.B.E., *Chairman.*

ASHCROFT, W.	ISMAY, J. H.	RAWLENCE, E. A.
BAKER, G. E. LLOYD	LATHAM, T.	SOMERVILLE, A. F.
BENYON, J. H.	NAPIER, H. B.	VOELCKER, DR. J. A., M.A.
GIBSON, J. T.	NEVILLE (GRENVILLE), R.	WALLACE, CAPT. T., M.Sc., M.C.
HOBHOUSE, RT. HON. H.	PENBERTHY, J. PROF., F.R.C.V.S.	
HURLE, J. C.		

(With power to add to their number.)

### FINANCE.

NAPIER, H. B., *Chairman.*

DAW, J. E.	GIBBS, A. H.
------------	--------------

### FORESTRY.

LIPSCOMB, G., *Chairman.*

ACKERS, MAJOR C. P.	DUCHESNE, M. C.	HOARE, SIR H. H. A., Bart.
CLINTON, LORD	EVANS, H. M. G.	NAPIER, H. B.
DRUMMOND COL. F. D. W., C.B.E.		

**IMPLEMENT REGULATIONS.***Chairman.*

BATH, MARQUIS OF, K.G.	MARTYN, G.	NAPIER, H. B.
BEST, CAPT. W.	MASON, F. F.	NEVILLE GRENVILLE, R.
EDWARDS, C. L. F.	MOORE-STEVENS, COL. R. A.	STUDDY, T. E.

**JOURNAL.***EDWARDS, C. L. F., Chairman.*

ACLAND, RT. HON. F. D., M.P.	BLEDISLOE, LORD
BAKER, G. E. LLOYD	HURLE, J. C.

**JUDGES' SELECTION.***WYNFORD, LIEUT.-COL. LORD, D.S.O., Chairman.*

ALEXANDER, D.	HOARE, SIR H. H. A.	MOORE-STEVENS, COL.
ALEXANDER, H. G.	Bart.	R. A.
ASHCROFT, W.	LATHAM, T.	PARRY-OKEDEN, LIEUT.
GORDON, G.		COL. U. E. P.

**RAILWAY ARRANGEMENTS AND ADVERTISEMENTS.**

ALEXANDER, D.	BLEDISLOE, LORD	DRUMMOND, H. W.
BATH, MARQUIS OF, K. G.	COVENTRY, EARL OF	MASON, F. F.

(With power to add to their number.)

**SCIENCE AND ART.***BATH, MARQUIS OF, K.G., Chairman.*

ACLAND, RT. HON., F.	DAW, J. E.	LIPSCOMB, G.
D., M.P.	EVANS, H. M. G.	LEWELYN, SIR J. T. D.,
CUNDALL, H. M. (I.S.O., F.S.A.)	FARWELL, MAJOR E. W.	Bart.
	HOBHOUSE, RT. HON. H.	NAPIER, H. B.

(With power to add to their number.)

**SELECTION.**

THE CHAIRMAN OF ALL OTHER COMMITTEES.

**SHOW PLACE AND DATE.**

CHAIRMAN OF THE ALLOTMENT, CONTRACTS, DAIRY, FINANCE, FORESTRY,  
IMPLEMENT REGULATIONS, RAILWAY ARRANGEMENTS, SCIENCE AND ART,  
AND STOCK PRIZE SHEET COMMITTEES.

(With power to add two Local Members to their number.)

**STOCK PRIZE SHEET.***WYNFORD, LIEUT.-COL. LORD, D.S.O., Chairman.*

ALEXANDER, D.	CLARK, W. H.	MOORE-STEVENS, COL.
ALEXANDER, H. G.	EVANS, H. M. G.	R. A.
ALLSEBROOK, A.	GIBBS, MAJOR A. H.	SHELLEY, J. F.
ASHCROFT, W.	HOARE, SIR H. H. A.	SUTTON, E. P. F.
BUCKINGHAM, REV. PREB.	Bart.	WHITE, A. R., O.B.E.
BUSE, W. G.	LATHAM, T.	WILLIAMS, MAJOR
CRICHTON MAJOR C. H.	LEWIS, COL. H.	JESTYN

**WORKS.**

**EDWARDS, C. L. F., Chairman.**

**BATH, MARQUIS OF, K.G.**  
**BEST, CAPT. W.**  
**MASON, F. F.**

**NAPIER, H. B.**  
**STUDDY, T. E.**

**Stewards.**

*Cattle, Sheep and Pigs.*  
**ASHCROFT, W.**  
**MOORE-STEVENS, COL. R. A.**  
**SHELLEY, J. F.**

*Cider.*  
**FARWELL, MAJOR E. W.**

*Dairy.*  
**SOMERVILLE, A. F.**  
**CLARK, W. H.**

*Experiments.*  
**ASHCROFT, W.**

*Finance.*  
**NAPIER, H. B.**  
**DAW, J. E.      GIBBS, A. H.**

*Forage.*  
**PEARCE, T. H.**

*Forestry.*  
**LIFSCOMB, G.**

*Horses.*  
**ALEXANDER, D.**  
**WYNFORD, LIEUT.-COL. LORD., D.S.O.**

*Horticulture.*  
**BOSCAWEN, REV. A. T.**

*Poultry.*  
**STUDDY, T. E.**

*Science and Art and Music.*  
**CUNDALL, H. M. (I.S.O., F.S.A.)**

*Shoring.*

*Yard.*  
**EDWARDS, C. L. F.**  
**BATH, MARQUIS OF, K.G.**  
**BEST, CAPT. W.**  
**STUDDY, T. E.**

**Other Honorary Officials.**

*Treasurer*—**LUTTRELL, C. M. F.**

*Chaplain.*  
**BOSCAWEN, REV. A. T.**

**Society's Representatives on Governing Bodies and Committees.**

*Dauntsey School Foundation*—**WHITE, A. R.**  
*National Fruit and Cider Institute*—**NAPIER, H. B., ACKERS, MAJOR C. P.**  
*Sugar Beet Growers Society*—**ALEXANDER, H. G.**  
*South Eastern Agricultural College, Wye*—**ASHCROFT, W.**  
*Dairy Eastern Committee of University College, Reading*—**LATHAM, T.**  
*Agricultural Education Committee of Wilts County Council*—**WHITE, A. R.**

**Permanent Officials.**

*Secretary and Editor*—**STORR, F. H., O.B.E.**

*Assistant Secretary*—**SMITH, W. A.**

*Auditor.*

**GOODMAN, F. C. (Chartered Accountant)**

*Consulting Chemist.*

**VOELCKER, DR. J. A. (M.A., F.I.C.)**

*Veterinary Inspector.*

**PENBERTHY, Prof. J. (F.R.C.V.S.)**

*Superintendent of Works.*

**AYRE, H. C.**

## Annual Exhibitions.

Year	Place Visited.	Prizes.			Totals' Local Contribution	President.	Admissions.		
		Local Subscrip- tion.	Local Com- munitie	Local Societies.	Local Repre- senta- tions		On 2/6 Days.	On 1/- Days.	Total.
1852	Taunton .	£ 210	£	£	£	Lord Portman	..	..	..
1853	Plymouth .	450	..	..	..	Sir T. D. Acland, Bart.	..	..	..
1854	Bath .	450	..	..	..	William Miles, M.P.	..	..	..
1855	Tiverton .	450	..	..	..	Earl Fortescue	..	..	..
1856	Yeovil .	450	..	..	..	C. A. Moody, M.P.	..	..	..
1857	Newton Abbot	700	..	..	..	Lord Courtenay	..	..	..
1858	Cardiff .	800	..	..	..	Lord Courtenay	..	..	..
1859	Barnstaple	800	85	..	81	John Sillitant	..	..	..
1860	Dorchester	900	..	..	..	Lord Rivers	10,709	11,949	22,658
1861	Truro .	900	..	..	..	J. W. Buller, M.P.	15,201	14,220	29,421
1862	Wells .	900	..	..	..	Sir T. D. Acland, Bart.	10,578	4,775	15,353
1863	Exeter .	900	..	..	..	Marquis of Bath	15,635	19,284	34,919
1864	Bristol .	1000	106	..	50	Earl Fortescue	22,377	65,678	88,055
1865	Hereford	900	358	..	1258	Lord Taunton	16,575	35,261	51,836
1866	Salisbury	900	57	..	..	Earl of Portsmouth	7,288	18,737	26,025
1867	Salisbury	..	..	..	..	J. Tremayne	7,502	16,702	24,204
1868	Fal mouth	900	..	..	..	Sir J. T. R. Duckworth, Bart.	11,393	19,495	30,888
1869	Southampton	900	132	..	18	Earl of Carnarvon	15,340	41,290	56,630
1870	Taunton	900	..	..	..	Sir S. H. Northcote, Bart., C.B., M.P.	17,952	33,653	51,605
1871	Guildford	900	110	..	..	Earl of Cork	10,656	23,406	34,062
1872	Dorchester	800	..	..	10	Duke of Marlborough, K.G.	12,791	21,517	34,308
1873	Plymouth	800	400	..	..	Earl of Mount-Edgcombe.	16,065	45,744	62,409
1874	Bristol .	800	403	..	..	Sir Massey Lopes, Bart., M.P.	37,329	72,791	110,120
1875	Croydon .	800	245	..	..	R. Benyon, M.P.	14,518	26,028	40,546
1876	Hereford	800	381	..	..	Earl of Ducie	16,396	32,645	49,041
1877	Bath .	800	215	..	..	Marquis of Lansdowne	27,625	48,852	76,477
1878	Oxford .	800	..	170	6	Earl of Jersey	12,414	26,995	39,409

## ANNUAL EXHIBITIONS—continued.

Year.	Place Visited.	Local Subscrip- tion.	Prizes.			Total Local Contri- bution.	President.	Admissions.			
			Local Com- mittee.	Local Societies	Local Resi- dents.			On 5/- Day.	On 2/6 Days.	On 1/- Days.	Total.
£	£	£	£	£	£						
1879	Exeter	800	..	..	10	810	Earl of Morley	..	14,634	40,533	55,167
1880	Worcester	800	..	254	..	1054	Earl of Coventry	..	8,415	37,675	46,090
1881	Tunbridge Wells	800	245	34	..	1079	Marquis of Abergavenny	..	13,368	33,236	46,604
1882	Cardiff	800	200	198	17	1215	Lord Tredegar	..	23,941	38,080	62,621
1883	Bridgwater	800	78	..	..	878	Lord Brooke, M.P.	..	17,171	31,241	48,412
1884	Maidstone	800	310	33	75	1218	Viscount Holmesdale	..	13,501	31,053	44,554
1885	Brighton	800	227	33	82	1142	Viscount Hampden	..	9,437	39,851	49,488
1886	Bristol	800	525	..	..	1325	Lord Carlisleford	..	20,580	70,999	100,579
1887	Dorchester	800	..	112	..	912	Earl of Ilchester	..	8,860	29,846	38,706
1888	Newport (Mon)	800	100	..	..	900	Lord Tredegar	..	14,878	38,567	53,415
1889	Exeter	800	..	..	10	810	Lord Clinton	..	16,403	36,195	52,600
1890	Rochester	800	294	..	26	1120	Earl of Darnley	..	3,480	48,314	51,794
1891	Bath	800	50	103	100	1053	Earl Temple	..	23,510	52,185	75,695
1892	Swansea	800	200	100	10	1110	Sir J. D. T. Llewelyn, Bart.	..	18,364	54,009	72,973
1893	Gloucester	800	400	..	..	1200	Lord Fitzhardinge	..	14,272	40,368	54,640
1894	Guildford	800	174	..	10	984	Earl of Onslow	..	8,671	29,813	38,484
1895	Taunton	800	85	160	10	1055	Viscount Portman	..	13,181	30,111	43,292
1896	St. Albans	800	152	..	..	952	Earl of Clarendon	..	12,056	22,880	34,436
1897	Southampton	800	50	..	..	850	Lord Montagu of Beaulieu	..	8,284	33,750	42,034
1898	Cardiff	800	200	..	..	1000	Lord Windsor	..	13,101	42,501	55,602
1899	Exeter	800	..	225	5	103	Lord Clinton	..	16,091	39,832	55,923
1900	Bath	800	100	150	10	1060	Marquis of Bath	954	11,601	36,814	49,369
1901	Croydon	800	115	..	..	915	H.R.H. The Duke of Cornwall (and York, K.G.)	1,196	9,362	30,893	41,251
1902	Plymouth	800	105	100	36	1041	Earl of Morley	842	12,029	40,565	54,036
1903	Bristol	800	434	50	61	1345	Duke of Beaufort	..	34,528	74,552	108,880
1904	Swansea	800	350	..	..	1150	Lord Windsor	..	28,265	50,562	78,827

ANNUAL EXHIBITIONS—*continued.*

Year.	Place Visited.	Local Subscrip- tion.	Prizes.			Total Local Contri- bution.	President.	Admissions.			
			Local Com- mittee.	Local Societies	Local Resi- dents.			On 5/- Day.	On 2/6 Days.	On 1/- Days.	Total.
1905	Nottingham	£ 800	£ ..	£ 218	£ ..	£ 1018	Duke of Portland, K.G. . .	..	8,913	45,964	54,977
1906	Swindon	800	..	203	50	1050	Earl of Radnor . . .	..	7,838	42,013	49,851
1907	Newport (Mon.)	800	201	51	29	1081	H.R.H. The Prince of Wales, K.G. .	..	16,236	37,819	54,055
1908	Dorchester	800	100	25	..	925	Lord Digby . . .	..	12,227	20,350	32,577
1909	Exeter	800	..	100	..	900	Lord Clinton . . .	..	14,898	41,891	56,789
1910	Rochester and Chatham	800	117	..	..	917	Earl of Darnley . . .	..	5,892	20,105	25,997
1911	Cardiff	800	195	110	10	1115	Marquis of Bute . . .	..	16,213	40,588	56,801
1912	Bath	800	100	100	..	1000	Marquis of Bath . . .	..	13,843	40,935	54,788
1913	Truro	800	35	115	39	918	Viscount Falkmouth . . .	..	12,918	44,700	57,618
1914	Swansea	800	301	..	..	1101	Sir J. T. D. Llewelyn, Bart. . .	..	17,957	67,805	85,762
1915	Worcester	400	..	257	..	657	The Earl of Coventry . . .	..	7,760	28,013	35,773
1916 to 1919	No Shows						The Earl of Coventry . . .		4/-	2/-	
1920	Salisbury	800	24	105	131	1060	The Earl of Radnor . . .	..	19,392	25,255	44,647
1921	Bristol	800	750	230	..	..	The Lord Bledisloe, K.B.E. . .	..			



## Members' Privileges.

### ANALYSES OF FERTILISERS, FEEDING STUFFS, WATERS, SOILS, &c.

*Applicable only to the case of Persons who are not commercially engaged in the manufacture or sale of any substance sent for Analysis).*

**Members of the Bath and West and Southern Counties Society, who may also be Members of other Agricultural Societies, are particularly requested in applying for Analyses, to state that they do so as Members of the first-named Society.**

THE following are the rates of Charges for Chemical Analyses to Members of the Society.

These privileges are applicable only when the analyses are for *bona-fide* agricultural purposes, and are required by Members of the Society for their own use and guidance in respect of farms or land in their own occupation and within the United Kingdom.

The analyses are given on the understanding that they are required for the individual and sole benefit of the Member applying for them, and must not be used for other persons, or for commercial purposes.

Land or estate agents, bailiffs, and others, when forwarding samples are required to state the names of those Members on whose behalf they apply.

Members are also allowed to send for analysis under these privileges any manures or feeding-stuffs to be used by their outgoing tenants, or which are to be given free of cost to their occupying tenants.

The analyses and reports may not be communicated to either vendor or manufacturer, except in cases of dispute.

Members are requested, when applying for an analysis, to quote the number in the subjoined schedule under which they wish it to be made.

No.		
1.	—An opinion of the purity of bone-dust or oil-cake (each sample) . . . . .	2s. 6d.
2.	—An analysis of sulphate or muriate of ammonia, or of nitrate of soda, together with an opinion as to whether it be worth the price charged . . . . .	5s.
3.	—An analysis of guano, showing the proportion of moisture, organic matter, sand, phosphate of lime, alkaline salts and ammonia, together with an opinion as to whether it be worth the price charged . . . . .	10s.
4.	—An analysis of mineral superphosphate of lime for soluble phosphates only, together with an opinion as to whether it be worth the price charged . . . . .	5s.
5.	—An analysis of superphosphate of lime, dissolved bones, etc., showing the proportions of moisture, organic matter, sand, soluble and insoluble phosphates, sulphate of lime and ammonia, together with an opinion as to whether it be worth the price charged . . . . .	10s.
6.	—An analysis of bone-dust, basic slag, or any other ordinary artificial manure together with an opinion as to whether it be worth the price charged . . . . .	10s.
7.	—An analysis of compound artificial manures, animal products, refuse substances used for manure, etc. . . . . from 10s. to £1	
8.	—An analysis of limestone, showing the proportion of lime . . . . .	7s. 6d.
9.	—An analysis of limestone, showing the proportion of lime and magnesia . . . . .	10s.
10.	—An analysis of limestone or marls, showing the proportion of carbonate, phosphate, and sulphate of lime and magnesia, with sand and clay . . . . .	10s.
11.	—Partial analysis of a soil, including determinations of clay, sand, organic matter, and carbonate of lime . . . . .	£1
12.	—Complete analysis of a soil . . . . .	£3
13.	—An analysis of oil-cake or other substance used for feeding purposes, showing the proportion of moisture, oil, mineral matter, albuminous matter, and woody fibre as well as of starch, gum, and sugar in the aggregate; and an opinion of its feeding and fattening or milk-producing properties . . . . .	10s.
14.	—Analysis of any vegetable product . . . . .	10s.
15.	—Determination of the "hardness" of a sample of water before and after boiling . . . . .	5s.
16.	—Analysis of water of land-drainage, and of water used for irrigation . . . . .	£1
17.	—Analysis of water used for domestic purposes . . . . .	£1 10s.
18.	—An analysis of milk (to assist Members in the management of their Dairies and Herds, <i>bona-fide</i> for their own information and not for trade purposes, nor for use in connection with the Sale of Food and Drugs Acts) . . . . .	5s.
19.	—Personal consultation with the Consulting Chemist. (To prevent disappointment it is suggested that Members desiring to hold a consultation with the Consulting Chemist should write to make an appointment) . . . . .	5s.
20.	—Consultation by letter . . . . .	5s.
21.	—Consultation necessitating the writing of three or more letters . . . . .	10s.

Members wishing to exercise their privileges on the above-named terms, should forward their samples for examination by *post* or *parcel prepaid*, to the Consulting Chemist, DR. JOHN AUGUSTUS VOELCKER, M.A., F.I.C., Stuart House, 1, Tudor Street, London, E.C.

The fees for analysis must be sent to the Consulting Chemist at the time of application.

## GUIDE TO PURCHASERS OF FERTILISERS AND FEEDING STUFFS.

Purchasers are recommended in every case to insist upon having an *Invoice* given to them. This invoice should set out clearly :—

In the case of **Fertilisers**—

- (1) The **name** of the fertiliser ;
- (2) Whether the fertiliser be artificially **compounded** or not ;
- (3) The **analysis** guaranteed in respect of the principal fertilising ingredients.

In the case of **Feeding-Stuffs**—

- (1) The **name** of the article ;
- (2) The **description** of the article : whether it has been made from one substance or seed only, or from more than one ;
- (3) The **analysis** guaranteed in respect of Oil and Albuminoids.

(NOTE.—The use of terms “ Linseed-cake,” “ Cotton-cake,” etc., implies that these cakes shall be “ pure ” and purchasers are recommended to insist upon these terms being used without any qualification such as “ 95 per cent.,” “ as imported,” etc. “ Oil cake ” should be avoided.

Members of the Society should see that the **Invoices** agree accurately with the orders given by them, and, in giving these orders, they should stipulate that the goods come up to the guarantees set out in the following list, and that they be sold **subject to the analysis and report of the Consulting Chemist of the Bath and West and Southern Counties Society.**

### FERTILISERS.

**Raw Bones, Bone-meal, or Bone-dust** to be guaranteed “ **PURE**,” and to contain not less than 45 per cent. of Phosphate of Lime, and not less than 4 per cent. of Ammonia.

**Steamed or “ Degelatinised ” Bones** to be guaranteed “ **PURE**,” and to contain not less than 55 per cent. of Phosphate of Lime, and not less than 1 per cent. of Ammonia.

**Mineral Superphosphate of Lime** to be guaranteed to contain a certain percentage of “ Soluble Phosphate.” [From 25 to 28 per cent. of Soluble Phosphate is an ordinarily good quality.]

**Dissolved Bones** to be guaranteed to be “ made from raw bone and acid only,” and to be sold as containing stated percentages of Soluble Phosphate, Insoluble Phosphates, and Ammonia.

**Compound Artificial Manures, Bone Manures, Bone Compounds, etc.,** to be sold by analysis stating the percentages of Soluble Phosphate, Insoluble Phosphates, and Ammonia contained.

**Basic Slag** to be guaranteed to contain a certain percentage of Phosphoric Acid, and to be sufficiently finely ground that 80 to 90 per cent. passes through a sieve having 10,000 meshes to the square inch.

**Peruvian Guano** to be described by that name, and to be sold by analysis stating the percentages of Phosphates and Ammonia.

**Sulphate of Ammonia** to be guaranteed to be “ **PURE**,” and to contain not less than 24 per cent. of Ammonia.

**Nitrate of Soda** to be guaranteed to be “ **PURE**,” and to contain 95 per cent. of Nitrate of Soda.

**Kainit** to be guaranteed to contain 23 per cent. of Sulphate of Potash.

All fertilisers to be delivered in good and suitable condition for sowing.

**FEEDING-STUFFS.**

**Linseed Cake, Cotton Cake** (Decorticated and Undecorticated), and **Rape Cake** (for feeding purposes) to be pure, i.e., prepared *only* from one kind of seed from which their name is derived, and to be in sound condition. The report of the Consulting Chemist of the Bath and West and Southern Counties Society to be conclusive as to the "purity" or otherwise of any feeding-stuffs. The percentages of Oil and Albuminoids must also be guaranteed.

**Mixed Feeding Cakes, Meals, etc.**, to be sold on a guaranteed analysis.

All Feeding-Stuffs to be sold in sound condition and to contain nothing of a injurious nature or worthless for feeding purposes.

## INSTRUCTIONS FOR SELECTING AND SENDING SAMPLES FOR ANALYSIS.

**GENERAL RULES.**

- 1.—A sample taken for analysis should be fairly *representative of the bulk* from which it has been drawn.
- 2.—The sample should reach the Analyst *in the same condition* as it was at the time when drawn.

**FERTILISERS.**

When **Fertilisers** are delivered in bags, select four or five of these from the bulk, and either turn them out on a floor and rapidly mix their contents, or else drive a shovel into each bag and draw out from as near the centre as possible a couple of shovelfuls of the manure, and mix these quickly on a floor.

Halve the heap obtained in either of these ways, take one-half (rejecting the other) and mix again rapidly, flattening down with the shovel any lumps that appear. Repeat this operation until at last only some three or four pounds are left.

From this fill three tins, holding from  $\frac{1}{2}$  lb. to 1 lb. each, mark, fasten up and seal each of these. Send one for analysis, and retain the others for reference.

Or,—the manure may be put into glass bottles provided with well-fitting corks; the bottles should be labelled and the corks sealed down. The sample sent for analysis can be packed in a wooden box and sent by post or rail.

When manures are delivered in bulk, portions should be successively drawn from *different parts* of the bulk, the heap being turned over now and again. The portions drawn should be thoroughly mixed, sub-divided, and, finally, samples should be taken as before, except that when the manure is coarse and bulky it is advisable to send larger samples than when it is in a finely-divided condition.

**FEEDING-STUFFS.**

**Linseed, Cotton, and other Feeding Cakes.**—If a single cake be taken three strips should be broken off right across the cake and from the middle portion of it, one piece to be sent for analysis, and the other two retained for reference. Each of the three pieces should be marked, wrapped in paper, fastened up and sealed. The piece forwarded for analysis can be sent by post or rail.

A more satisfactory plan is to select four to six cakes from different parts of the delivery, then break off a piece about four inches wide from the middle of each cake, and pass these pieces through a cake-breaker. The broken cake should then be well mixed, and three samples of about 1 lb. each should be taken and put in tins or bags duly marked, fastened, and sealed as before. One of

these lots should be sent for analysis, the remaining two being kept for reference. It is advisable also, with the broken pieces, to send a small strip from an unbroken cake.

**Feeding Meals, Grain, etc.**—Handfuls should be drawn from the centre of half-a-dozen different bags of the delivery: these lots should then be well mixed, and three  $\frac{1}{2}$ lb. tins or bags filled from the heap, each being marked, fastened up, and sealed. One sample is to be forwarded for analysis and the others retained for reference.

### SOILS, WATERS, &c.

**Soils.**—Have a wooden box made, 6 inches in length and width, and from 9 to 12 inches deep, according to the depth of soil and subsoil of the field. Mark out in the field a space of about 12 inches square; dig round in a slanting direction a trench, so as to leave undisturbed a block of soil and its subsoil 9 to 12 inches deep; trim this block to make it fit into the wooden box, invert the open box over it, press down firmly, then pass a spade under the box and lift it up gently, turn over the box, nail on the lid, and send by rail. The soil will then be received in the position in which it is found in the field.

In the case of very light, sandy, and porous soils, the wooden box may be at once inverted over the soil and forced down by pressure, and then dug out.

**Waters.**—Samples of water are best sent in glass-stoppered Winchester bottles holding half a gallon. One such bottle is sufficient for a single sample. Care should be taken to have these scrupulously clean. In taking a sample of water for analysis it is advisable to reject the first portion drawn or pumped, so as to obtain a sample of the water when in ordinary flow. The bottle should be rinsed out with the water that is to be analysed, and it should be filled nearly to the top. The stopper should be secured with string, or be tied over with linen or soft leather. The sample can then be sent carefully packed either in a wooden box with sawdust, etc., or in a hamper with straw.

**Milk.**—A pint bottle should be sent in a wooden box.

### GENERAL INSTRUCTIONS.

**Time for Taking Samples.**—All samples, both of fertilisers and feeding-stuffs, should be taken as soon after their delivery as possible, and should reach the Analyst within *ten days* after delivery of the article. In every case it is advisable that the Analyst's certificate be received before a fertiliser is sown or a feeding-stuff is given to stock.

**Procedure in the event of the Vendor wishing Fresh Samples to be Drawn.**—Should a purchaser find that the Analyst's certificate shows a fertiliser or feeding-stuff not to come up to the guarantee given him, he may inform the vendor of the result and complain accordingly. He should then send to the vendor *one* of the two samples which he has kept for reference. If, however, the vendor should demand that a fresh sample be drawn, the purchaser must allow this, and also give the vendor an opportunity of being present, either in person or through a representative whom he may appoint. In that case, three samples should be taken in the presence of both parties with the same precautions as before described, *each* of which should be duly packed up, labelled and *sealed* by both parties. One of these is to be given to the vendor, one is to be sent to the Analyst, and the third is to be kept by the purchaser for reference or future analysis if necessary.

All samples intended for the Consulting Chemist of the Society should be addressed (postage or carriage prepaid) to Dr. J. AUGUSTUS VOELOKER, M.A., F.I.C., Stuart Yousse, 1, Tudor Street, New Bridge Street, London, E.C. Separate letters of instruction should be sent at the same time.

# **BRISTOL MEETING,**

**MAY 31, JUNE 1, 2, 3 and 4, 1921.**

<b>MONEY PRIZES.</b>						<b>PAGE</b>
<b>HORSES</b> .. .. .	£1,352	0	0			<b>cix</b>
<b>CATTLE</b> .. .. .	1,400	0	0			<b>cix</b>
<b>DAIRY HERDS</b> .. .. .	200	0	0			<b>cix</b>
<b>SHEEP</b> .. .. .	725	0	0			<b>cix</b>
<b>GOATS</b> .. .. .	28	0	0			<b>cxxiii</b>
<b>PIGS</b> .. .. .	461	0	0			<b>cxxiv</b>
<b>CIDER</b> .. .. .	30	0	0			<b>cxxvi</b>
<b>CHEESE</b> .. .. .	104	0	0			<b>cxxvii</b>
<b>CREAM CHEESE, BUTTER AND CREAM</b> ..	53	0	0			<b>cxxvii</b>
<b>BUTTER-MAKING</b> .. .. .	45	0	0			<b>cxxviii</b>
<b>MILKING</b> .. .. .	11	5	0			<b>cxxviii</b>
<b>SHOEING</b> .. .. .	51	10	0			<b>cxxix</b>
<b>POULTRY</b> .. .. .	163	10	0			<b>cxli</b>
<hr/>						
<b>£4,624 5 0</b>						
<hr/>						

## **DONORS OF MEDALS, PLATE, &c.**

Lord Bledisloe  
 Bath and West Society  
 Gloucestershire Agricultural Society  
 Shire Horse Society  
 Hunters' Improvement and National Light Horse  
     Breeding Society  
 Welsh Pony and Cob Society  
 National Pony Society  
 Hackney Horse Society  
 Chas. A. Hanson, Esq.  
 Shorthorn Society  
 Aberdeen-Angus Cattle Society  
 Argentine Aberdeen-Angus Cattle Society  
 English Kerry and Dexter Cattle Society  
 English Jersey Cattle Society  
 Southdown Sheep Society  
 British Goat Society  
 National Pig Breeders' Association  
 Gloucestershire Old Spots Pig Society  
 Wessex Saddleback Pig Society  
 Poultry Club

**DONORS OF MONEY PRIZES.**

Bath and West and Southern Counties Society..	£2,789	15	6
Bristol Local Committee .. ..	580	0	0
Society of Merchant Venturers, Bristol .. ..	50	0	0
Gloucestershire Agricultural Society .. ..	158	0	0
Somerset County Agricultural Association .. ..	135	0	0
Shire Horse Society (or Medal) .. ..	15	0	0
Suffolk Horse Society .. ..	36	0	0
British Percheron Horse Society.. ..	33	0	0
Welsh Pony and Cob Society .. ..	40	0	0
Devon Cattle Breeders' Society .. ..	37	0	0
South Devon Herd Book Society.. ..	17	0	0
Shorthorn Society .. ..	30	0	0
Dairy Shorthorn Association .. ..	10	0	0
E. Ezra, Esq. .. ..	17	0	0
Hereford Herd Book Society .. ..	37	0	0
Gloucestershire Cattle Society .. ..	20	0	0
Red Poll Cattle Society .. ..	34	0	0
English Aberdeen-Angus Cattle Association .. ..	10	0	0
British Friesian Cattle Society .. ..	25	0	0
English Jersey Cattle Society .. ..	20	0	0
English Guernsey Cattle Society .. ..	38	0	0
English Kerry and Dexter Cattle Society .. ..	40	10	0
Lord Bledisloe .. ..	24	10	0
Shropshire Sheep Breeders' Association .. ..	10	0	0
South Devon Flock Book Association .. ..	10	0	0
Kent or Romney Marsh Sheep Breeders' Association .. ..	17	0	0
Southdown Sheep Society .. ..	17	0	0
Hampshire Down Sheep Breeders' Association .. ..	20	0	0
Oxford Down Sheep Breeders' Association .. ..	10	0	0
Dorset Horn Sheep Breeders' Association .. ..	17	0	0
Dorset Down Sheep Breeders' Association .. ..	15	0	0
Exmoor Horn Sheep Breeders' Society .. ..	10	0	0
Suffolk Sheep Society .. ..	25	0	0
Ryeland Flock Book Society .. ..	15	0	0
Kerry Hill (Wales) Flock Book Society.. ..	15	0	0
British Goat Society .. ..	5	0	0
Countess Bathurst .. ..	5	0	0
Mrs. Reed Smith .. ..	2	2	0
Miss E. Skidmore.. ..	2	2	0
Miss Whitfield .. ..	1	0	0
Miss Skidmore .. ..	0	10	6
M. B. Bruce, Esq. .. ..	0	10	0
R. Turner, Esq. .. ..	0	5	0
British Berkshire Society .. ..	9	0	0
Large Black Pig Society .. ..	30	0	0
Gloucestershire Old Spots Pig Society .. ..	100	0	0
Wessex Saddleback Pig Society .. ..	30	0	0
Gloucestershire County Agricultural Education Committee .. ..	23	0	0
Somerset County Agricultural Instruction Committee .. ..	38	0	0
<hr/>			
	£4,624	5	0

(In addition to the above, prizes are offered for Allotments and Small Holdings toward which the Bristol Local Committee contribute £140).

## PRIZES.

The Prizes in Classes 18, 19, 20, 29, 30, 56, 57, 67, 151, 152, 153 and 232 and £134 towards the Harness and Jumping prizes are contributed by the Bristol Local Committee; the Prizes in Classes 6, 31, 88, 92, 97, 98, 99, 178, 179, two Special Prizes for Gloucestershire Old Spots Pigs, and £50 towards the other Prizes in the Horse, Cattle, Sheep and Pig Classes by the Gloucestershire Agricultural Society; and the Special Prizes for residents in Somerset and £25 towards other prizes by the Somerset County Agricultural Association.

*An Animal can be entered in as many Classes as it is eligible for on payment of an additional fee in each Class. No additional fee is, however, payable in the case of those Prizes headed as Champion or Special Prizes.*

First Prize.	Second Prize.	Third Prize.
£	£	£

## HORSES.

Entry Fees, including Box : Members, 30/- ;  
Non-Members, 60/- each entry.

Exhibitors are requested to note that Animals entered in Classes 1 to 20 must be in the Yard before 8 a.m., on Tuesday, May 31st, and (except the Stallions in Classes 7, 8, 12 and 13, (which can be removed after the Parade of Horses on the third day of the Show) must remain in the Yard till 6 o'clock on Saturday, June 4th.

### SHIRE.

(Registered or eligible for registration in the Shire Horse Society's Stud Book).

Judge—C. W. TINDALL, Wainfleet, Lincolnshire.

#### CLASS.

1.—MARE, in-foal, or with foal at foot .. .. .	15	10	3
2.—FILLY or GELDING, foaled in 1920 .. .. .	10	5	3
3.—FILLY or GELDING, foaled in 1919 .. .. .	10	5	3
4.—FILLY or GELDING, foaled in 1918 .. .. .	10	5	3

The Prizes in Class 5 are offered by the Society of Merchant Venturers, Bristol.

5.—Brood Mare, with two of her progeny, the property of a bona fide Farmer, whose sole occupation is farming, within a radius of 50 miles of Bristol .. .. .	25	15	10
6.—Mare or Filly, shown in one of the above Classes by a Member of the Gloucestershire Agricultural Society (Entry fee, 10s.) .. .. .	7	5	
7.—STALLION, foaled before 1919 .. .. .	15	10	3
8.—STALLION, foaled in 1919 .. .. .	15	10	3
9.—COLT, foaled in 1920 .. .. .	15	10	3

#### SPECIAL PRIZES.

Open only to Residents in the County of Somerset for animals entered in the above Classes.

(A) Best Brood Mare, in-foal, or with foal at foot ..	10
(B) Best Filly, foaled in 1919 or 1920 .. .. .	10
(C) Best Colt or Gelding, foaled in 1919 or 1920 ..	10

#### MEDAL.

Offered by the Shire Horse Society.

(D) A Gold Medal, or the sum of £10, for the best Mare or Filly in the Shire Horse Classes, under Condition 47, and to the Breeder of the winner under the Condition stated, a prize of .. .. .	10
	5

SUFFOLK.						First Prize.	Second Prize.	Third Prize.
Judge—E. H. WILLIAMS, Alderton Hall, Woodbridge, Suffolk.						£	£	£
£96 towards the Prizes in Classes 10 to 13 are contributed by the Suffolk Horse Society.								
CLASS.								
10.—Filly, foaled in 1919..	..	..	..	..	..	10	5	3
11.—Filly, foaled in 1918..	..	..	..	..	..	10	5	3
12.—STALLION, foaled in 1918 ..	..	..	..	..	..	10	5	3
13.—STALLION, foaled in 1919 ..	..	..	..	..	..	10	5	3

## PERCHERONS.

Judge—T. L. WICKHAM BOYNTON, Burton Agnes  
Hall, East Yorks.

£33 towards the Prizes in Classes 14 to 17 are contributed by the British  
Percheron Horse Society.

## CLASS.

14.—Mare, with foal at foot..	..	..	..	..	..	10	5	3
15.—COLT or FILLY foal, produce of Mare in Class 14 ..	..	..	..	..	..	6	4	2
(Entry fee: Members, 5/-. Non-Members, 10/-.)								
16.—FILLY, foaled in 1918 or 1919 ..	..	..	..	..	..	10	5	3
17.—COLT or FILLY, foaled in 1920 ..	..	..	..	..	..	10	5	3

## ANY AGRICULTURAL BREED.

Judge—C. W. TINDALL, Wainfleet, Lincolnshire.

## CLASS.

18.—Mare or Gelding, not under 4 years old, suitable for town purposes, the bona fide property of a yeoman or tenant farmer, whose sole occupation is farming and whose farm is situated within 25 miles of the Guildhall, Bristol ..	..	..	..	..	..	10	5	3
19.—Filly or Gelding, foaled in 1919, the owner residing within 25 miles of the Guildhall, Bristol ..	..	..	..	..	..	10	5	3
20.—Filly, Colt or Gelding, foaled in 1920, the owner residing within 25 miles of the Guildhall, Bristol ..	..	..	..	..	..	10	5	3

(In Classes 18, 19 and 20, the animals exhibited must have been in the possession of the owner for not less than six months previous to the closing of the entries.)

## HUNTERS.

Judge—T. L. WICKHAM BOYNTON, Burton Agnes  
Hall, East Yorkshire.

Animals entered in Classes 21 to 31 must be in the Yard before 8 a.m. on Tuesday, May 31, and must remain there till 4 p.m. on Thursday, June 2nd, when they must be removed from the Yard.

21.—MARE, in-Foal, or with Foal at foot ..	..	..	..	..	..	15	10	3
22.—FILLY, COLT or GELDING, foaled in 1920 ..	..	..	..	..	..	10	5	3
23.—FILLY, COLT or GELDING, foaled in 1919 ..	..	..	..	..	..	10	5	3



**HUNTERS**—*continued.*

	First Prize.	Second Prize.	Third Prize.
CLASS.	£	£	£
24.—FILLY or GELDING, foaled in 1918 .. .. .	10	5	3
25.—MARE or GELDING, foaled in 1917 .. .. .	10	5	3
26.—MARE or GELDING, foaled before 1918, to carry under 14 stone .. .. .	20	10	3
27.—MARE or GELDING, foaled before 1918, to carry 14 stone or over .. .. .	20	10	3
28.—MARE or GELDING, foaled before 1918, that has not won a Prize of £10 or over under Saddle at any Show held previous to April 16th, 1921 .. .. .	10	5	3
29.—Mare or Gelding, foaled before 1917, to carry 14 stone and over, the owner residing within 25 miles of the Guildhall, Bristol .. .. .	20	10	5
30.—Mare or Gelding, foaled before 1917, to carry 12 stone and under 14 stone, the owner residing within 25 miles of the Guildhall, Bristol .. .. .	20	10	5
31.—Mare or Gelding, five years old or over, shown in any of the above Classes by a member of the Gloucestershire Agricultural Society (Entry fee, 10/-.) .. .. .	7	5	

**SPECIAL PRIZES.**

- (E) Best Hunter not exceeding 4 years old, the property of a resident in Somerset .. .. . 10
- (F) Best Hunter Brood Mare, in-foal or with foal at foot, ditto .. .. . 10  
Offered by the Gloucestershire Agricultural Society.
- (G) The Cheltenham Challenge Cup, value £20, for the best exhibit in Class 31. The Cup to be won by the same exhibitor with different animals 3 years in succession or 4 years at intervals, before becoming his absolute property. (The Cup to be retained by the winner until May 10th, 1922, when it must be returned to the Secretary of the Gloucestershire Agricultural Society, security being given for the performance of this condition).

**MEDALS.**

- Offered by the Hunters' Improvement and National Light Horse Breeding Society, under Conditions 48 and 49.
- (H) A Gold Medal, or £5 and a Bronze Medal, for the Best Hunter Brood Mare in Class 21, registered with a number in the Hunter Stud Book, at the time of entry or within a month of the award, not having previously won the above-named Society's Gold Medal as a Brood Mare in 1921, and which must have her foal at foot, or produce a living foal in 1921 to a thoroughbred horse or Registered Hunter sire. In the second instance a certificate to that effect must be forwarded before the Medal is sent.
- (I) A Silver Medal or £1 (at the option of the winner), for the Best Hunter Mare or Gelding of any age, exhibited by a member of the Hunters' Improvement and National Light Horse Breeding Society, whose subscription to that Society must be paid within a month of the award.
- Only Prize-winners in the Classes will be eligible for these Medals.

**COBS AND PONIES.**

Animals entered in Classes 32 to 42 must be brought into the yard after 6 p.m. on Thursday, June 2nd, and before 8 a.m. on Friday, June 3rd, and must remain in the Yard until 6 p.m. on Saturday, June 4th.

**WELSH COBS.**

Judge—J. R. BACHE, The Cedars, Knighton, Radnorshire.  
£40 towards the prizes in Classes 32 to 39 are contributed through the Welsh Cob and Pony Society.

**CLASS.**

32.—MARE, foaled in or before 1917, in-foal or with foal at foot .. .. .	5	3	2
33.—FILLY, COLT or GELDING, foaled in 1918 or 1919 .. .. .	5	3	2
34.—FILLY, COLT or GELDING, foaled in 1920 .. .. .	5	3	2
35.—STALLION, foaled in or before 1917 .. .. .	5	3	2

	First Prize.	Second Prize.	Third Prize.
<b>WELSH MOUNTAIN PONIES.</b>			
CLASS.	£	£	£
36.—BROOD MARE, foaled in or before 1917, not exceeding 12 hands, neither docked or hogged, in-foal or with foal at foot, and must produce a foal in 1921 before receiving a prize .. .. .	5	3	2
37.—FILLY, COLT or GELDING, foaled in 1918 or 1919, if foaled in 1918 height not to exceed 12 hands, and if foaled in 1919, 11.2 hands .. .. .	5	3	2
38.—FILLY, COLT or GELDING, foaled in 1920, not exceeding 11 hands .. .. .	5	3	2
39.—STALLION, foaled in or before 1917, not exceeding 12 hands and neither docked or hogged ..	5	3	2

**SPECIAL PRIZES**

Offered by the Welsh Pony and Cob Society.

A Silver Medal and Illustrated Certificate—

(J) For the best Welsh Cob Mare or Filly exhibited in Classes 32 to 34.

(K) For the best Welsh Cob Stallion exhibited in Classes 33 to 35.

(L) For the best Welsh Mountain Pony Mare or Filly exhibited in Classes 36 to 38.

(M) For the best Welsh Mountain Pony Stallion or Colt exhibited in Classes 37 to 39.

**OTHER PONIES.**Judge —E. P. NORTHEY, Higher Bowden,  
Okehampton.

CLASS.

40.—MARE, not exceeding 14.2 hands, suitable to breed Polo or Riding Ponies, in-Foal or with Foal at foot..	8	4	2
41.—FILLY, COLT or GELDING, foaled in 1919 .. .. .	8	4	2
42.—STALLION, not exceeding 15 hands, suitable to get Polo or Riding Ponies .. .. .	8	4	2

**MEDALS.**

Offered by the National Pony Society.

(N) A Silver Medal for the best Polo Pony Brood Mare in the Brood Mare Class, entered or eligible for entry in the National Pony Stud Book

(O) A Silver Medal for the best Polo Pony Stallion, entered or eligible for entry in the National Pony Stud Book; or best Polo Pony Entire Colt, one two or three years old, entered or eligible for entry in the National Pony Supplement, i.e., (a) by an Entered Sire, and out of a Entered or Registered Dam; or (b) by a Thorough-bred, Arab. or Barb Sire and out of an Entered Dam.

(Note: "Registered" signifies entered in the "National Pony Approval Mare Registered.")

These Medals are offered subject to Condition No. 51.

**HARNESS AND SADDLE.**Judge —F. VIVIAN GOOCH, Junior Constitutional Club,  
Piccadilly, London, W.1.

Entry Fees : With Box, Members, 30/- ; Non-Members, 60/- each entry; without Box : Members, 5/- ; Non-Members, 10/-

ENTRIES CLOSE { With Boxes—April 9 or at double fees April 16.  
Without Boxes—at 5 p.m. on the evening of the day preceeding the Competition.

Horses entered in other Classes can, if eligible, be also entered on payment of an additional fee, in the Harness and Saddle Classes.

Horses entered in the Harness and Saddle Classes only and not having a box in the Yard must be in the Show Yard by 1 p.m. on the day on which they compete, and, with the consent of the Stewards, may leave the Yard as soon as the class has been judged.

<b>HARNESS AND SADDLE—continued,</b>		<b>First Prize.</b>	<b>Second Prize.</b>	<b>Third Prize.</b>
<b>CLASS.</b>		<b>£</b>	<b>£</b>	<b>£</b>
43.—	MARE or GELDING, under 15 hands, to be driven in harness on the 1st day of the Show .. .. .	10	5	2
44.—	MARE or GELDING, any height, for riding purposes, to be shown in saddle on the 1st day of the Show..	10	5	2
45.—	MARE or GELDING, 15 hands or over, to be driven in harness on the 2nd day of the Show .. .. .	10	5	2
46.—	PONY, not exceeding 13.2 hands, suitable for, and to be ridden by, a child not over 14 years of age, on the second day of the Show .. .. .	5	3	1
(A Whip will be presented to the Boy and Girl riders of the three Prize Winners in this Class).				
47.—	PACING. Best Mare, Stallion or Gelding, not exceeding 14.3 hands, to be driven in harness on the second day of the Show.. .. .	10	5	2
48.—	MARE or GELDING, any height, that has not previously won a First Prize at the Royal, Bath and West or Royal Counties Show, to be driven in harness on the 3rd day of the Show .. .. .	10	5	2
49.—	TROTTING. Best MARE, STALLION or GELDING, not exceeding 14.3 hands, for speed, to be driven in harness on the 3rd day of the Show .. .. .	10	5	2
50.—	HACK, 14 hands and not over 15.2, suitable for and to be ridden by a lady, on the 3rd day of the Show	10	5	2
51.—	TANDEMS, MARES or GELDINGS, to be shown in Harness on the 4th day of the Show .. .. .	15	10	5
52.—	PACING. Best Mare, Stallion or Gelding, exceeding 14.3 hands, to be driven in Harness on the 4th day of the Show .. .. .	10	5	2
53.—	PAIRS of MARES or GELDINGS, to be shown in Harness on the 4th day of the Show .. .. .	15	10	5
54.—	MARE or GELDING, not over 13.2 hands, to be driven in harness on the 5th day of the Show .. .. .	10	5	2
55.—	TROTTING. Best MARE, STALLION or GELDING, exceeding 14.3 hands, for speed, to be driven in harness on the 5th day of the Show .. .. .	10	5	2
<b>TRADESMEN'S CLASSES.</b>				
56.—	Light Mare or Gelding, the property of a Tradesman residing within a radius of four miles from the Guildhall, Bristol, used solely by him for trade purposes for a period of not less than three months prior to May 31st, 1921, to be exhibited on the 5th day of the Show in the Trade Cart and Harness in which it has been worked for the same period .. .. .	10	5	2
57.—	Cart Mare or Gelding, ditto, ditto .. .. .	10	5	2
<b>MEDAL.</b>				
Offered by the Hackney Horse Society.				
(P) A Silver Medal for the best Mare or Gelding exhibited in Single Harness in Classes 43 to 57, subject to Conditions 50.				

**JUMPING.**

The Society reserves the right to cancel the Classes for Jumping in the event of sufficient entries not being forthcoming. In such case notice will be given to Exhibitors and any Entry Fee paid will be returned.  
(For Regulations as to Jumping Classes see Conditions 52).

**Entry Fees : With Box, Members, 30/- ; Non-Members, 60/- each entry ; Without Box, Members, 5/- ; Non-Members, 10/-.**

**ENTRIES CLOSE** { With Boxes—April 9, or at double fees April 16  
Without Boxes— at 5 p.m. on the evening preceding the day of Competition.

Horses can be entered in as many Jumping Classes as they are eligible for on payment of the entry fee for each Class, and can take Second or Third Prize in each Class, but only one First Prize on the first three days of the Show. In the event of an animal which has already won a First Prize in the aforesaid Classes being again placed first, the Animal next in point of merit will, if eligible, succeed to the First Prize, and the Stewards reserve the right to amend the Awards correspondingly, and if necessary to proportionately reduce the amounts paid to the other Prize Winners in the Class. The award to two or more exhibits of an equal first will not debar such Animals from taking a First Prize in a later class. Horses entered in the Jumping Classes only, and not having a box in the Yard, must be in the Show Yard by 1 p.m. on the day on which they compete and, with the consent of the Stewards may leave the Yard as soon as the Class has been judged.

**CLASS.**

**58.—MARE or GELDING, 15 hands and over that shall jump over the course in the best form on the 1st day of the Show** .. .. .

First Prize	Second Prize	Third Prize
£	£	£

**59.—MARE or GELDING, under 15 hands, ditto, ditto** .. .. .

**60.—MARE or GELDING, 15.3 hands and over that shall jump over the course in the best form on the 2nd day of the Show** .. .. .

**61.—MARE or GELDING, under 15.3 hands, ditto, ditto** .. .. .

**62.—MARE or GELDING, that shall jump highest on the 3rd day of the Show** .. .. .

**63.—MARE or Gelding, any height, that shall jump over the course in the best form on the 3rd day of the Show** .. .. .

**64.—MARE or GELDING, 15.3 hands and over, that shall jump over the course in the best form on the 4th day of the Show** .. .. .

**65.—MARE or GELDING, under 15.3 hands, ditto, ditto** .. .. .

**66.—MARE or GELDING, that shall jump highest on the 4th day of the Show** .. .. .

**67.—Mare or Gelding, the property of a resident within 25 miles of the Guildhall, Bristol, that shall jump over the course in the best form on the 5th day of the Show** .. .. .

**CHAMPION CLASS.**

**68.—MARE or GELDING, any height, having won a Prize in Classes 58 to 67 that shall jump over the course in the best form on the 5th day of the Show** .. .. .

(In this Class the whole of the Jumps will be raised at the discretion of the Stewards).

# CATTLE.

Entry Fees : Members, 20/- ; Non-Members, 40/-,  
each entry.

## DEVON.

Judge—L. H. ALFORD, Horridge, Ashford, Barnstaple.

The First Prize in Class 69 and the Prizes in Class 70 are contributed by the Devon Cattle Breeders' Society.

### CLASS.

	First Prize.	Second Prize.	Third Prize.
	£	£	£
69.—Cow, in-Milk, calved before 1918 .. .. .	10	5	2
70.—Cow or Heifer, in-Milk, to be milked in the Ring before judging, under Conditions No. 61 .. .. .	10	5	2
71.—HEIFER, in-Milk, calved in 1918 .. .. .	10	5	2
72.—HEIFER, calved in 1919 .. .. .	10	5	2
73.—HEIFER, calved in 1920 .. .. .	10	5	2
74.—BULL, calved in 1917 or 1918 .. .. .	10	5	2
75.—BULL, calved in 1919 .. .. .	10	5	2
76.—BULL, calved in 1920 .. .. .	10	5	2

### SPECIAL PRIZES.

Open only to Residents in Somerset  
for animals entered in the above Classes.

Best Bull, of any age .. .. .	10		
Best Cow or Heifer, of any age .. .. .	10		

### CHAMPION PRIZE.

Offered by the Devon Cattle Breeders' Society.

Best Animal exhibited in Classes 69 to 76 .. .. .	10		
---	----	--	--

## SOUTH DEVON.

Judge—W. ROWE, Fairfield, Abbotskerswell.

The Prizes in Class 77 are offered by the South Devon Herd Book Society.

77.—Cow or Heifer, in-Milk or in-Calf, and if in-Calf to calve within three months of the date of the Show .. .. .	10	5	2
78.—Cow or HEIFER, in Milk, calved in 1918 .. .. .	10	5	2
79.—HEIFER, calved in 1919 .. .. .	10	5	2
80.—HEIFER, calved in 1920 .. .. .	10	5	2
81.—BULL, calved in 1917 or 1918 .. .. .	10	5	2
82.—BULL, calved in 1919 .. .. .	10	5	2
83.—BULL, calved in 1920 .. .. .	10	5	2

### SPECIAL PRIZE.

Offered by Charles A. Hanson, Esq., Fowey Hall, Cornwall,  
Alderman of the City of London.

A Challenge Cup for the Best Cow in-Milk, in the South Devon Classes, to be won three times in succession or four times altogether, before becoming the property of the winner

## SHORTHORN.

Judge—J. DEANE WILLIS, Bapton Manor, Codford, Wilts.

84.—Cow, in-Milk, calved before 1918 .. .. .	10	5	2
85.—HEIFER, in-Milk, calved in 1918 .. .. .	10	5	2
86.—HEIFER, calved in 1919 .. .. .	10	5	2
87.—HEIFER, calved in 1920 .. .. .	10	5	2
88.—Cow or Heifer, exhibited in any of the above Classes by a Member of the Gloucestershire Agricultural Society. (Entry Fee, 10/-). .. .. .	7	5	

<b>CATTLE—continued.</b>			
<b>SHORTHORN—continued.</b>			
CLASS.	First Prize.	Second Prize.	Third Prize.
89.—BULL, calved in 1917 or 1918 .. .. .	10	5	2
90.—BULL, calved in 1919 .. .. .	10	5	2
91.—BULL, calved in 1920 .. .. .	10	5	2
92.—Bull, calved in 1919, exhibited in Class 90 by a member of the Gloucestershire Agricultural Society (Entry Fee, 10/-) .. .. .	7	5	
<b>CHAMPION PRIZES.</b>			
Offered by the President (Lord Bledisloe).			
<b>A Challenge Cup, value £20, for the best Bull in Classes 89 to 92</b>			
Offered by the Shorthorn Society.			
<b>Best Bull in Classes 89 to 92 entered in, or eligible for entry in Coates's Herd Book, with Silver Medal to the Breeder</b>	10		
<b>DAIRY SHORTHORN.</b>			
<b>Judge—J. L. SHIRLEY, Silvertown, Woughton, Bucks.</b>			
The First Prizes in Classes 93 and 94 (and a Silver Medal to the Breeder of the winners) are offered by the Shorthorn Society in conjunction with the Dairy Shorthorn Association, and the First Prize in Class 95 by the Dairy Shorthorn Association.			
93.—Pedigree Cow, in-Milk, calved in or before 1917, eligible for, and entered in Coates's Herd Book, or pedigree sent for such entry previous to the Show, and not having previously won a similar prize offered by the above-named Society or Association in 1920, to be milked in the Ring before judging, under Conditions 61 .. .. .	10	5	
94.—Ditto, calved in or after 1918, ditto, ditto .. .. .	10	5	
95.—Pedigree Bull, calved in 1920, entered or their pedigrees accepted for entry in Coates's Herd Book, subject to Conditions No. 62 .. .. .	10	5	
The Prizes in Class 96 are offered by Mr. E. Eara, of Lock, Partridge Green, SUSSEX.			
96.—Pedigree Heifer, calved in 1920, eligible for and entered in Coates's Herd Book or pedigree sent for such entry previous to the Show .. .. .	10	5	2
97.—Cow, in-Milk, exhibited in Class 93 by a member of the Gloucestershire Agricultural Society .. .. .	7	5	
98.—Heifer, in-Milk, calved in 1918, exhibited in Class 94, ditto, ditto .. .. .	7	5	
99.—Bull, exhibited in Class 95, ditto, ditto .. .. .	7	5	
(Entry Fee in Classes 97, 98 and 99, 10/-).			
<b>SPECIAL PRIZES.</b>			
For animals entered in the above Classes.			
<b>Best Pure Bred Registered Dairy Shorthorn Cow or Heifer the property of a resident in Somerset</b> .. .. .	10		
<b>Ditto, ditto, Bull, ditto</b> .. .. .	10		
Offered by the Gloucestershire Agricultural Society.			
The "Cirencester" Challenge Cup, value £50, for the best Animal eligible for entry in Coates's Herd Book, exhibited in Classes 84 to 99, by a member of the Gloucestershire Agricultural Society, to be won three times in succession or four times at intervals with different Animals before becoming the absolute property of the winner.			
The "Radcliffe" Challenge Cup, for the best Bull eligible for entry in Coates's Herd Book, in Classes 89 to 92 and 95, exhibited by a tenant farmer who is a member of the Gloucestershire Agricultural Society, to be won three times by the same exhibitor with different Animals before becoming his absolute property.			
(These Cups to be retained by the successful exhibitor until May 10th, 1922, when they must be returned to the Secretary of the Gloucestershire Agricultural Society, security being given for the performance of this condition.)			

**HEREFORD.**

**Judge—A. E. HUGHES, The Laurels, Bargates,  
Leominster.**

The Prizes in Class 107 and the Champion Prizes are offered by the Hereford Herd Book Society.

**CLASS.**

	First Prize.	Second Prize.	Third Prize.
100.—Cow, in-Milk, calved before 1918 .. .. .	10	5	2
101.—HEIFER, in-Milk, calved in 1918 .. .. .	10	5	2
102.—HEIFER, calved in 1919 .. .. .	10	5	2
103.—HEIFER, calved in 1920 .. .. .	10	5	2
104.—BULL, calved in 1917 or 1918 .. .. .	10	5	2
105.—BULL, calved in 1919 .. .. .	10	5	2
106.—BULL, calved in January or February, 1920 .. .. .	10	5	2
107.—Bull, calved on or after March 1st, 1920 .. .. .	10	5	2

**CHAMPION PRIZES.**

Best registered Cow or Heifer in Classes 100 to 103 .. .. .	10		
Best registered Bull in Classes 104 to 107 .. .. .	10		

**GLOUCESTERSHIRE.**

**Judge—A. JONES, Bowcott Farm, Wotton-under-Edge.**

#20 of the Prizes in Classes 108 and 111 are offered by the Gloucestershire Cattle Society.

108.—Cow or Heifer, in-Milk, calved before 1919 .. .. .	7	3	
109.—Heifer, calved in 1919 or 1920 .. .. .	7	3	
110.—Bull, calved before December 31, 1919 .. .. .	7	3	
111.—Bull, calved after December 31, 1919 .. .. .	7	3	

**RED POLL.**

**Judge—R. B. ASTLEY, Compton Beauchamp,  
Shrivenham.**

#34 towards the Prizes in Classes 112 to 115 are contributed by the Red Poll Cattle Society.

112.—Cow or HEIFER, in-Milk, calved before 1919 .. .. .	10	5	2
113.—HEIFER, calved in 1919 or 1920 .. .. .	10	5	2
114.—BULL, calved in or before 1919 .. .. .	10	5	2
115.—BULL, calved in 1920 .. .. .	10	5	2

**ABERDEEN-ANGUS.**

**Judge—G. MILL, Estate Office, Claverdon Leys, Warwick.**

The First Prize in Class 116 is offered by the English Aberdeen-Angus Cattle Association.

116.—Cow or HEIFER, in-Milk, calved before 1st December, 1918 .. .. .	10	5	2
117.—HEIFER, calved on or after 1st December, 1918 .. .. .	10	5	2
118.—HEIFER, calved on or after 1st December, 1919 .. .. .	10	5	2
119.—BULL, calved before December 1st, 1919 .. .. .	10	5	2
120.—BULL, calved on or after December 1st, 1919 .. .. .	10	5	2

**CHAMPION PRIZES.**

Offered by the Aberdeen-Angus Cattle Society.

A Silver Medal for the Best Animal in Classes 116 to 120.

A Silver Medal for the Best Animal of opposite sex, ditto.

Offered by the Argentine Aberdeen-Angus Society.

A Silver Medal for the best Animal in Classes 116 to 120.

<b>CATTLE—continued.</b>				First Prize.	Second Prize.	Third Prize.
				£	£	£
<b>BRITISH FRIESIAN.</b>						
<b>Judge—STUART HEATON, Sudbourne Hall, Orford, Suffolk.</b>						
<b>£25 towards the Prizes in Classes 121 to 124 are contributed by the British Friesian Cattle Society.</b>						
<b>CLASS.</b>						
121.—COW or HEIFER, any age, in-Milk .. .. .	10	5	2			
122.—HEIFER, not in-Milk, calved in 1919 or 1920 .. .. .	10	5	2			
123.—BULL, calved in or before 1919 .. .. .	10	5	2			
124.—BULL, calved in 1920 .. .. .	10	5	2			
<b>JERSEY.</b>						
<b>Judges :—</b>						
<b>Cows and Heifers : H. PADWICK, The Red House, West Ashling, Chichester.</b>						
<b>Bulls : C. C. TUDWAY, The Cedars, Wells, Somerset.</b>						
<b>The Prizes in Class 125 are offered by the English Jersey Cattle Society.</b>						
125.—COW or HEIFER, in-Milk, entered in or eligible for entry in the English Jersey Herd Book, sired in Great Britain or Ireland .. .. .	5	3	2			
126.—COW, in-Milk, calved before 1918 .. .. .	10	5	2			
127.—COW or HEIFER, in-Milk, calved in 1918 .. .. .	10	5	2			
128.—HEIFER, in-Milk, calved in or since 1919 .. .. .	10	5	2			
129.—HEIFER, calved in 1920 .. .. .	10	5	2			
130.—BULL, calved in 1917 or 1918 .. .. .	10	5	2			
131.—BULL, calved in 1919 .. .. .	10	5	2			
132.—BULL, calved in 1920 .. .. .	10	5	2			
<b>GUERNSEY.</b>						
<b>Judge—C. RICHARDSON, Lynchmere Farm, Haslemere.</b>						
<b>£20 towards the Prizes in the Guernsey Classes are contributed by the English Guernsey Cattle Society.</b>						
133.—COW, in-Milk, calved before 1918 .. .. .	10	5	2			
134.—HEIFER, in-Milk, calved in 1918 .. .. .	10	5	2			
135.—HEIFER, calved in 1919 .. .. .	10	5	2			
136.—HEIFER, calved in 1920 .. .. .	10	5	2			
137.—BULL, calved in 1917 or 1918 .. .. .	10	5	2			
138.—BULL, calved in 1919 .. .. .	10	5	2			
139.—BULL, calved in 1920 .. .. .	10	5	2			
<b>KERRY.</b>						
<b>Judge—G. TITUS BARHAM, Sudbury Park, Wembley, Middlesex.</b>						
<b>£25 10s. towards the prizes in the Kerry Classes are contributed by the English Kerry and Dexter Cattle Society.</b>						
140.—COW or HEIFER, in-Milk, calved in or before 1918 .. .. .	10	5	2			
141.—HEIFER, calved in 1919 or 1920 .. .. .	10	5	2			
142.—BULL, calved in 1918, 1919 or 1920 .. .. .	10	5	2			



<b>CATTLE—continued.</b>			
	First Prize.	Second Prize.	Third Prize.
	£	£	£
<b>DEXTER.</b>			
<b>Judge—G. TITUS BARHAM, Sudbury Park, Wembley, Middlesex.</b>			
<b>CLASS.</b>			
143.— <b>Cow or HEIFER</b> , in-Milk, calved in or before 1918 ..	10	5	2
144.— <b>HEIFER</b> , calved in 1919 or 1920 .. .. .	10	5	2
145.— <b>BULL</b> , calved in 1918, 1919. or 1920 .. .. .	10	5	2
The Prizes in Class 146 are offered by the English Kerry and Dexter Cattle Society.			
146.— <b>Bull</b> , calved in 1920, whose sire and dam are entered in the English Kerry and Dexter or Royal Dublin Society's Herd Book .. .. .	10	3	2
<b>SPECIAL PRIZE.</b>			
Offered by the English Kerry and Dexter Cattle Society.			
The Devonshire Challenge Cup, for the Best Animal in Classes 140 to 146, bred by Exhibitor, and entered in or eligible for the English Kerry and Dexter Herd Book. The Cup to be won by the same Exhibitor with different animals three years in succession before becoming his absolute property.			
The Certificate of Award of the English Kerry and Dexter Cattle Society will be given to the owner of the winning animal on each occasion the Cup is competed for.			
<b>MILK TEST.</b>			
(See Regulation 64.)			
<i>Animals entered in the Breed Classes can, if eligible, be entered also, on payment of an additional fee of 10/- for Members and 20/- for Non-Members, in Classes 147 to 150.</i>			
147.— <b>Cow</b> , in-Milk, of any breed or cross, under 950lbs. live weight, yielding the largest quantity of milk, of normal character, containing at each time of milking, 12 per cent. of total solids, of which not less than 3 per cent. shall be fat, the period of lactation being taken into consideration .. .. .	10	5	2
148.— <b>Cow</b> , in Milk, of any breed or cross, 950lbs. live weight or over, ditto, ditto .. .. .	10	5	2
<b>SPECIAL PRIZES.</b>			
Offered by the English Kerry and Dexter Cattle Society.			
Gold, Silver and Bronze Medals for the three best Dexter Cows competing in Classes 147 and 148.			
<b>BUTTER TEST.</b>			
(See Regulation 64.)			
<b>Judge—A. F. SOMERVILLE, Dinder House, Wells, Somt.</b>			
The Prizes in Class 149 are offered by the English Jersey Cattle Society and in Class 150 by the English Guernsey Cattle Society, and entries in them are subject to any conditions issued by these Societies previous to the tests.			
149.— <b>Cow</b> , eligible for or entered in the English Jersey Herd Book, obtaining the greatest number of points by the practical test of the separator and churn, judged by the scale of points adopted by the English Jersey Cattle Society .. .. .	Gold Medal or 10	Silver Medal.	Bronze Medal
Certificates of Merit will also be awarded to Cows under 5 years old obtaining 30 points, and to Cows 5 years old or over obtaining 35 points.			

*Prizes for Cattle and Sheep for 1921.*

		First Prize.	Second Prize.	Third Prize.
<b>BUTTER TEST</b> — <i>continued.</i>				
Judge—J. W. ASHBY, 12, Hanover Square, London, W.		£	£	£
CLASS.				
150.—Cow, eligible for or entered in the English Guernsey Herd Book, obtaining the greatest number of points by the practical test of the separator and churn, judged by the scale of points adopted by the English Guernsey Cattle Society . . . .		10	5	3
<b>DAIRY HERDS.</b>				
Judges—Classes 151 & 152—D. T. THRING, Estates Bursar, Merton College, Oxford.				
Class 153—W. NIXON, Offchurch, Leamington.				
The Prizes in Classes 151 to 153 are offered by the Bristol Local Committee.				
Entry Fees : Members, £1 ; Non-Members, £2.				
151.—Herd of not less than 30 Dairy Cows, the property of a bona fide Yeoman or Tenant Farmer residing within 25 miles of the Guildhall, Bristol . . . .		30	15	10
152.—Herd of over 15 and under 30 Dairy Cows, the property of a bona fide Yeoman or Tenant Farmer residing within 25 miles of the Guildhall, Bristol . . . .		20	15	10
153.—Best Dairy Herd in the Counties of Gloucester or Somerset, the owner to be a member of a Ministry of Agriculture Milk Recording Association, points of judging to be settled by the Central Association of Milk Recording Societies . . . .				
		1st Prize £40	2nd Prize £30	3rd Prize £20
				4th Prize £10

The Animals entered in Classes 151 to 153 will be judged on the farms to which they belong and will not be exhibited in the Show Yard, and an exhibitor in Class 151 or 152 cannot also compete in Class 153.

## SHEEP.

Entry Fees : Members, 20/- ; Non-Members, 40/-, each entry.

### SHROPSHIRE.

Judge—J. MINTON, Dryton, Wroxeter, Salop.

The First Prize in Class 154 is contributed by the Shropshire Sheep Breeders' Association.

CLASS.

154.—Shearling RAM . . . . .	10	5	2
155.—Pair of RAM LAMBS, dropped in 1921 . . . . .	10	5	2
156.—Pen of 3 Shearling EWES . . . . .	10	5	2

### DEVON LONGWOOLLED.

Judge—E. LAWRENCE, Rull Farm, Cullompton, Devon.

157.—Shearling RAM . . . . .	10	5	2
158.—Pen of three Shearling EWES . . . . .	10	5	2

**SHEEP—continued.****SOUTH DEVON.**

Judge—F. J. WINTLE, Keynedon Barton, Kingsbridge.

The First Prize in Class 159 is contributed by the South Devon Flock Book Association.

**CLASS.**

	First Prize.	Second Prize.	Third Prize.
	£	£	£
159.—Ram, other than Shearling .. .. .	10	5	2
160.—Shearling RAM .. .. .	10	5	2
161.—Pen of three Shearling EWES .. .. .	10	5	2

**KENT OR ROMNEY MARSH.**

Judge—H. B. AMOS, Ripton, Ashford, Kent.

The Prizes in Class 162 are offered by the Kent or Romney Marsh Sheep Breeders' Association.

162.—Two Shear Ram .. .. .	10	5	2
163.—Shearling RAM .. .. .	10	5	2
164.—Pair of RAM LAMBS, dropped in 1921 .. .. .	10	5	2
165.—Pen of three Shearling EWES .. .. .	10	5	2

**SOUTHDOWN.**

Judge—M. TUPPER, Bignor, Pulborough, Sussex.

The Prizes in Class 166 are offered by the Southdown Sheep Society.

166.—Two Shear Ram .. .. .	10	5	2
167.—Shearling RAM .. .. .	10	5	2
168.—Pair of RAM LAMBS, dropped in 1921 .. .. .	10	5	2
169.—Pen of three Shearling EWES .. .. .	10	5	2

**SPECIAL PRIZES.**

Offered by the Southdown Sheep Society, under Condition 67.  
Silver Medal or £1 for the Best Ram or Ram Lamb in Classes 166, 167, and 168.

**HAMPSHIRE DOWN.**

Judge—T. A. EDNEY HAYTER, Highbury, Whitechurch, Hants.

The Prizes in Class 171 and the Champion Prize are offered by the Hampshire Down Sheep Breeders' Association.

170.—Shearling RAM .. .. .	10	5	2
171.—Ram Lamb, dropped in 1921 .. .. .	7	5	2
172.—Pair of RAM LAMBS, dropped in 1921 .. .. .	10	5	2
173.—Pen of three Shearling EWES .. .. .	10	5	2

**CHAMPION PRIZE.**

Offered by the Hampshire Down Sheep Breeders' Association.

Best Pen of Lambs in Classes 171 and 172 .. .. .	5
--	---

(Single Ram Lamb to constitute a pen).

**OXFORD DOWN.**

Judge—C. E. J. HOBBS, Little Faringdon, Lechlade.

174.—Shearling RAM .. .. .	10	5	2
175.—Pair of RAM LAMBS, dropped in 1921 .. .. .	10	5	2
176.—Pen of three Shearling EWES .. .. .	10	5	2

The Prizes in Class 177 are offered by the Oxford Down Sheep Breeders' Association, and will be withheld until the Animals awarded the Prizes are registered in the Flock Book.

177.—Pair of Ewe Lambs, dropped in 1921 .. .. .	6	3	1
---	---	---	---

SHEEP—continued.		First Prize	Second Prize.	Third Prize.
OXFORD DOWN—continued.		£	£	£
CLASS.				
178.—Ram or Ram Lamb exhibited in Class 174 or 175 by a member of the Gloucestershire Agricultural Society .. .. .		5	2	
179.—Shearling Ewe or Ewe Lamb, exhibited in Class 176 or 177 by a member of the Gloucestershire Agricultural Society .. .. .		5	2	
(Entry Fee in Classes 178 and 179, 10/-).				
DORSET HORN.				
Judge—W. J. CHICK, Stratton, Dorchester.				
180.—Shearling RAM .. .. .		10	5	2
181.—Pair of RAM LAMBS, dropped after November 1st, 1920 .. .. .		10	5	2
182.—Pen of three Shearling EWES .. .. .		10	5	2
The Prizes in Class 183 are offered by the Dorset Horn Sheep Breeders' Association.				
183.—Pen of three Ewe Lambs, dropped after Nov. 1st, 1920 .. .. .		10	5	2
SPECIAL PRIZE.				
Best Exhibit in Classes 180 to 183, the property of a resident in Somerset .. .. .		5		
DORSET DOWN.				
Judge—J. SPICER, Bovington, Wool.				
The Prizes in Class 184 are offered by the Dorset Down Sheep Breeders' Association.				
184.—Shearling Ram .. .. .		10	3	2
185.—Pair of RAM LAMBS, dropped in 1921 .. .. .		10	5	2
186.—Pen of three Shearling EWES .. .. .		10	5	2
EXMOOR HORN.				
Judge—D. N. PURCHASE, Great Hele Barton, South Molton.				
The First Prize in Class 187 is offered by the Exmoor Horn Sheep Breeders' Society.				
187.—Ram, 2 shear and upwards .. .. .		10	5	2
188.—Shearling RAM .. .. .		10	5	2
189.—Pen of three Shearling EWES .. .. .		10	5	2
SPECIAL PRIZES.				
Best Exhibit in Classes 187 to 189, the property of a resident in Somerset .. .. .		5		
SUFFOLK.				
Judge—W. BOGGIS, Carlton Grange, Brinkley, Newmarket.				
£20 towards the Prizes in Classes 190 to 192 are contributed by the President (Lord Bledisloe) and £25 by the Suffolk Sheep Society.				
190.—Shearling Ram .. .. .		10	5	2
191.—Pair of Ram Lambs dropped in 1921 .. .. .		10	5	2
192.—Pen of 3 Ewe Lambs dropped in 1921 .. .. .		10	5	2

**SHEEP—continued.****RYELAND.**

Judge—D. J. THOMAS, Talachddu, Brecon.

£15 of the Prizes in Classes 193 to 195 are offered by the Ryeland Sheep Society.

**CLASS.**

	First Prize.	Second Prize.	Third Prize.
	£	£	£
193.—SHEARLING RAM .. .. .	7	4	2
194.—Pair of RAM LAMBS, dropped in 1921 .. .. .	7	4	2
195.—Pen of 3 SHEARLING EWES .. .. .	7	4	2

**KERRY HILL.**

(To be shown uncoloured).

Judge—T. E. KINSEY, Winsbury, Chirbury, Salop.

£15 of the prizes in Classes 196 to 198 are offered by the Kerry Hill (Wales) Flock Book Society.

196.—RAM, 2 shear and upwards .. .. .	7	4	2
197.—SHEARLING RAM .. .. .	7	4	2
198.—Pen of 3 SHEARLING EWES .. .. .	7	4	2

**GOATS.**

(For Regulations see Entry Forms).

Entry Fees : Members, 7 6 : Non-Members, 10/- each entry.

Judge—Capt. H. D. J. K. GREENWAY, 52, Thurloe Square, S. Kensington, London, S.W.8.

£5 towards the Prizes in Classes 199 to 204 are contributed by the Countess Bathurst : £5 by the British Goat Society ; £2 2s. 0d. each by Mrs. Reed Smith and Miss E. Skidmore ; £1 by Miss Whitfield ; 10s. 6d. by Miss Skidmore ; and 10s. by Mr. M. B. Bruce and 5s. by Mr. R. Turner.

199.—FEMALE GOAT. Swiss, including Toggenburg, Anglo-Swiss, British Alpine, British Saanenor, British Toggenburg, over 2 years .. .. .	2 10	1 10	s. 15
200.—FEMALE GOAT. Anglo-Nubian, and Any Other Variety not included in Class 199, over 2 years .. .. .	2 10	1 10	15
201.—GOATLING. Any variety, over 1 year but not exceeding 2 years .. .. .	2 10	1 10	15
202.—FEMALE KID. Any variety .. .. .	2 0	1 10	15
203.—MALE GOAT. Any variety, over 1 year .. .. .	2 10	1 10	15
204.—MILKING COMPETITION for Goats. Any variety .. .. .	2 10	1 10	15

**SPECIAL PRIZES.**

Offered by the British Goat Society.

For Animals entered in Classes 199 to 204 :—

Challenge Certificate for the best Female Goat that has borne a kid.

Challenge Certificate for the best Dual Purpose Goat.

Challenge Certificate for the best Male Goat over 1 year.

PIGS.				First Prize.	Second Prize.	Third Prize.
				£	£	£
Entry Fees : Members, 20/- ; Non-Members, 40/- each Entry.						
<b>BERKSHIRE.</b>						
Judge—W. V. JUDD, Manor Farm, Micheldever, Hants.						
£4 towards the Prizes in Classes 205 to 208 are contributed by the British Berkshire Society.						
CLASS.						
205.—BOAR, farrowed in 1918, 1919 or 1920 .. .. .	7	3	2			
206.—Pair of BOARS, farrowed in 1921 .. .. .	5	2	1			
207.—Breeding Sow, farrowed before 1921 .. .. .	7	3	2			
208.—Pair of Breeding Sows, farrowed in 1921 .. .. .	5	2	1			
<b>SPECIAL PRIZE.</b>						
Offered by the British Berkshire Society.						
Best Boar or Sow in the Berkshire Classes entered in, or eligible for, the Herd Book, whose Sire and Dam, together with the name of its Breeder, are entered in the Catalogue				5		
<b>LARGE BLACK.</b>						
Judge—H. J. KINGWELL, Bow Grange, Totnes, Devon.						
£40 towards the prizes in the Large Black Classes and the Champion Prizes are contributed by the Large Black Pig Society.						
209.—BOAR, farrowed before May 1, 1920 .. .. .	7	5	2			
210.—BOAR, not exceeding 12 months old on May 1, 1921	7	5	2			
211.—BOAR, farrowed in 1921 .. .. .	7	3	2			
212.—BREEDING SOW, farrowed before May 1, 1920 .. .. .	7	5	2			
213.—BREEDING SOW, not exceeding 12 months old on May 1, 1921 .. .. .	7	5	2			
214.—Pair of BREEDING SOWS, farrowed in 1921 .. .. .	7	3	2			
<b>CHAMPION PRIZES.</b>						
Best Animal in Classes 209 to 211 .. .. .	5					
Best Animal in Classes 212 to 214 .. .. .	5					
<b>LARGE WHITE.</b>						
Judge—G. SINCLAIR, Home Farm, Dalmeny House, Edinburgh.						
215.—BOAR, farrowed in 1918, 1919, or 1920 .. .. .	7	3	2			
216.—Pair of BOARS, farrowed in 1921 .. .. .	5	2	1			
217.—Breeding Sow, farrowed before 1921 .. .. .	7	3	2			
218.—Pair of Breeding Sows, farrowed in 1921 .. .. .	5	2	1			
<b>MIDDLE WHITE.</b>						
Judge—G. SINCLAIR, Home Farm, Dalmeny House, Edinburgh.						
219.—BOAR, farrowed in 1918, 1919, or 1920 .. .. .	7	3	2			
220.—Pair of BOARS, farrowed in 1921 .. .. .	5	2	1			

	First Prize.	Second Prize.	Third Prize.
<b>PIGS—continued.</b>			
<b>CLASS.</b>	£	£	£
221.—Breeding Sow, farrowed before 1921 .. .. .	7	3	2
222.—Pair of Breeding Sows, farrowed in 1921 .. .. .	5	2	1
<b>CHAMPION PRIZES.</b>			
* Offered by the National Pig Breeders' Association.			
A GOLD MEDAL, value \$5, for the Best Boar in Class 215 or 216.			
A GOLD MEDAL, value \$5, for the Best Sow in Class 217 or 218.			
A GOLD MEDAL, value \$5, for the Best Boar in Class 219 or 220.			
A GOLD MEDAL, value \$5, for the Best Sow in Class 221 or 222.			
<b>GLOUCESTERSHIRE OLD SPOTS.</b>			
<b>Judges—Boars—W. NIXON, Offchurch, Leamington Spa.</b>			
<b>Sows—H. BRIDGMAN, Downend, near Bristol.</b>			
<b>\$100 towards the Prizes in Classes 223 to 231 and the Champion Prizes are offered by the Gloucestershire Old Spots Pig Society.</b>			
223.—BOAR, farrowed before January 1st, 1920 .. .. .	7	3	2
224.—BOAR, farrowed in 1920, before July 1st .. .. .	7	3	2
225.—BOAR, farrowed after June 30th, 1920 .. .. .	6	2	1
226.—Two BOARS, farrowed in 1921 .. .. .	7	3	2
227.—Breeding Sow, farrowed before 1920 .. .. .	10	5	2
228.—Sow, farrowed in 1920, before July 1st .. .. .	10	5	2
229.—Two Sows or HILTS, farrowed after June 30th, 1920 .. .. .	8	3	2
230.—Two HILTS, farrowed in 1921 .. .. .	10	5	2
231.—Sow, with litter (the latter not exceeding 8 weeks old at time of exhibition) .. .. .	8	5	3
<b>SPECIAL PRIZES.</b>			
Best Boar, exhibited in Classes 223 to 226 by a Member of the Gloucestershire Agricultural Society .. .. .	5		4th \$1
Best Sow, exhibited in Classes 227 to 231 by ditto .. .. .	5		
Offered by Henry Bridgman, Esq., J.P., C.C.			
To the Herdsmen whose exhibits shall win the greatest number of points, counting one point for commended, two for highly commended and so additional upwards .. .. .	3 3	2 2	
Offered by Mrs. Eldred Walker.			
To the Gloucestershire Old Spots Herdsman who shall keep his pens and exhibits in the cleanest and neatest condition throughout the Show .. .. .	2 2	1 1	
<b>CHAMPION PRIZES.</b>			
The Sir George Watson Challenge Cup, value £21, for the best Animal in Classes 223 to 231. (The Cup to be won three times by the same Exhibitor with different animals before becoming his own property).			
The Deane-Drummond Cup, value £14 14s., for the best Boar in Classes 223 to 226.			
The Hiatt-Baker Cup for the best Sow in Classes 227 to 231.			
(The "Deane Drummond" and "Hiatt-Baker" Cups to be won twice by the same exhibitor with different animals before becoming his own property.)			
<b>HERDS.</b>			
Offered by the Bristol Local Committee.			
<b>Judge : J. H. WHITE, Bagborough Home Farm, Shepton Mallet.</b>			
232.—Best Herd of Gloucestershire Old Spot Pigs, the herd to comprise of not less than five Breeding Sows and not less than two-thirds of the Herd to have been bred by the Exhibitor who must be a resident within 50 miles of the Guildhall, Bristol .. .. .	25	15	10
(The Animals entered in Class 232 will be judged on the farm to which they belong and will not be exhibited in the Show Yard).			
(Entry Fee in Class 232 : Members, \$1 ; Non-Members, \$2).			

	First Prize.	Second Prize.	Third Prize.
	£	£	£
<b>PIGS—continued.</b>			
<b>WESSEX SADDLEBACK.</b>			
Judge—H. C. KNAPMAN, Estate Office, Norman Court, Salisbury.			
£30 towards the Prizes in Classes 233 to 238 and the Champion Prize are offered by the Wessex Saddleback Pig Society.			
<b>CLASS.</b>			
233.—BOAR, farrowed in 1919 .. .. .	6	3	2
234.—BOAR, farrowed in 1920 .. .. .	6	3	2
235.—BOAR, farrowed in 1921 .. .. .	5	2	1
236.—BREEDING SOW, farrowed in 1919 .. .. .	6	3	2
237.—BREEDING SOW, farrowed in 1920 .. .. .	6	3	2
238.—Pair of BREEDING SOWS, farrowed in 1921 .. .. .	5	2	1

**GOLD MEDAL.**

Value £5 5s. for the best Pig exhibited in Classes 233 to 238.

**CHAMPION PRIZE.**

Offered by the President (Lord Bledisloe).

A Silver Cup, value £30, for the best Boar in the Show of any breed.

**PRODUCE.**

**CIDER.**

(Open to Growers or Makers).

Entry Fees : Members, 3/6 ; Non-Members, 6 - each entry.

Judge—Prof. B. T. P. BARKER, M.A., National Fruit and Cider Institute, Long Ashton, Bristol.

239.—Cask of not less than 9 and not more than 30 gallons of CIDER, made in 1920, of a specific gravity not exceeding 1.015 at 60° Fahr. .. .. .	3	2	1
240.—12 Bottles of CIDER, made in 1920, ditto .. .. .	3	2	1
241.—Cask of not less than 9 and not more than 30 gallons of CIDER, made in 1920 .. .. .	3	2	1
242.—12 Bottles of CIDER, made in 1920 .. .. .	3	2	1
243.—12 Bottles of CIDER, made in any year previous to 1920 .. .. .	3	2	1



	First Prize.	Second Prize.	Third Prize.	Fourth Prize.
	£ s.	£ s.	£ s.	£ s.
<b>CHEESE.</b>				
Entry Fees : Class 244, Members, 10/- ; Non-Members, 20/-. Classes 245 and 248 to 250, Members, 7/6 ; Non-Members, 15/- ; Classes 246 and 247, 5/- each entry.				
Judge—J. R. ALLEN, Highfield, Shepton Mallet.				
<b>CLASS.</b>				
244.—Three Cheddar CHEESES (not less than 56lbs. each) made in 1920 .. .. .	10 0	7 0	4 0	
245.—Three Cheddar CHEESES (not over 56lbs. each) made in 1920 .. .. .	8 0	5 0	3 0	
Offered by the Somerset County Agricultural Instruction Committee.				
246.—Three Cheddar Cheeses, not less than 56lbs. each, made by a Student who has attended the Somerset County Dairy Classes during the years 1916–1921 inclusive .. .. .	8 0	5 0	3 0	
247.—Three Small Cheese, not exceeding 10lbs. each, made by a Student of the Somerset County Classes on Small Cheesemaking .. .. .	5 0	3 0	1 0	
248.—Three Single Gloucester or Wilts CHEESES made in 1920 .. .. .	6 0	4 0	2 0	
249.—Eight Loaf or other Truckle CHEESES, made in 1920 .. .. .	5 0	3 0	2 0	
250.—Three Caerphilly CHEESES, made in 1921 .. .. .	5 0	3 0	2 0	

**SPECIAL PRIZES.**

Open only to Residents in Somerset.

Best exhibit of Cheddar Cheese, not less than 50lbs. in weight .. .. .	5 0
Best exhibit of three Caerphilly Cheese .. .. .	5 0

**CREAM CHEESE, BUTTER AND CREAM.***(These Classes are not open to Professional Teachers)*

Entry Fees : Classes 251 to 253, 255 and 256, Members, 3/6 ; Non-Members, 6/- ; Class 254, 3/6, each entry.

Judge—Mrs. A. M. LUKE, 9, St. James's Place, The Hoe, Plymouth.

251.—Three Cream or other Soft CHEESES .. .. .	3 0	2 0	1 0	0 10
252.—2lbs. of Fresh (or very slightly salted) BUTTER .. .. .	4 0	3 0	2 0	1 0
253.—2lbs. of BUTTER, in the making of which no salt has been used, to be judged on the last day of the Show .. .. .	4 0	3 0	2 0	1 0
Offered by the Gloucestershire County Agricultural Education Committee.				
254.—2lbs. of Butter made by a Gloucestershire County Council Dairy Student .. .. .	3 0	2 0	1 0	0 10
255.—12lbs. of Keeping BUTTER, in a jar or crock, to be delivered to the Secretary 4 weeks before the Show .. .. .	5 0	4 0	3 0	2 0
256.—4 half-pounds of Scalded CREAM .. .. .	3 0	2 0	1 0	

## COMPETITIONS.

## BUTTER-MAKING.

(No Winner of a first prize given by this Society for Butter-making during the last 3 years is eligible to compete in Class 257 or 259.)

Entry Fees : Classes 257, 259, 261 and 262, Members, 3/6 ; Non-Members, 6/- ; Classes 258 and 260, 3/6, each entry.

Judge—Mrs. A. M. LUKE, 9, St. James's Place, The Hoe, Plymouth.

The Prizes in Classes 258 and 260 are offered by the Gloucestershire County Agricultural Education Committee and competition is confined to Gloucestershire County Council Dairy Students.

(For Conditions and Regulations see Entry Form.)

## CLASSES.

	First Prize.	Second Prize.	Third Prize.	Fourth Prize.
	£ s.	£ s.	£ s.	£ s.
257.—For Men and Women, bona fide workers on a farm. On the 2nd day of the Show..	4 0	3 0	1 10	1 0
258.—Novice Class. For Gloucestershire County Council Dairy Students who have not hitherto entered in a public Butter-making Competition. On the 2nd day of the Show .. .. .	3 0	2 0	1 0	0 10
259.—For Students who have been through a course of instruction in Butter-making at any County Council School, and who have not previously won a first or second prize at one of the Society's Shows. On the 3rd day of the Show .. .. .	4 0	3 0	1 10	1 0
260.—For Gloucestershire County Council Dairy Students, on the 3rd day of the Show ..	4 0	3 0	2 0	1 0
261.—For Men and Women, on the 4th day of the Show .. .. .	4 0	3 0	1 10	1 0
262.—For Winners of First and Second Prizes in the Butter-making Classes 257 to 261, or at any previous meeting of the Society. On the 5th day of the Show				
1st Prize, Gold Medal.				
2nd .. Silver Medal.				
3rd .. Bronze Medal.				

## MILKING.

Entry Fees : 2/6 each entry.

The 1st Prizes in Classes 263, 264 and 265 are offered by the President (Lord Bledisloe).

Judge—H. BRIDGMAN, Downend, Bristol.

263.—For Men, 16 years of age and over .. ..	1 10	1 0	0 15	0 10
264.—For Women, 16 years of age and over .. ..	1 10	1 0	0 15	0 10
265.—For Boys and Girls under 16 years of age ..	1 10	1 0	0 15	0 10

**SHOEING.**

**Entry Fees :** Members, 5s. ; Non-Members, 10/- each entry, half of which will be returned to those taking part in the Competitions.

The Prizes in Classes 267 and 269 are offered by the Somerset County Agricultural Instruction Committee and are open only to Students who have attended the Somerset County Council Farriery Classes since August 1st. 1919, and have not previously won a first prize at any of the Society's Meetings or a Championship Prize at any National or County Agricultural Society's Show, and no mechanical aids, such as Bob-Punch, Flatter, Guide Fuller, Wire Brush, &c., will be allowed in making or fitting the shoes.

**Judge—W. A. WELCH, M.R.C.V.S., Walcot Street, Bath.**

**CLASS.**

		First Prize.	Second Prize.	Third Prize.	Fourth Prize
		£ s.	£ s.	£ s.	£ s.
266.—For	CART HORSE SHOEING, by Smiths not over 22 years of age on the day of Competition, who have not previously won the First Prize in a corresponding Class at one of the Society's Meetings, or a Championship Prize at any National or County Agricultural Society's Show, on the 2nd day of the Show . . . . .	4 0	3 0	2 0	1 0
267.	Cart Horse Shoeing (Students' Class), ditto, ditto. On the second day of the Show . .	3 0	2 0	1 0	0 10
268.—For	NAG HORSE SHOEING, by Smiths over 22 years of age on the day of Competition, ditto, ditto, on the third day of the Show . . . . .	4 0	3 0	2 0	1 0
269.	Nag Horse Shoeing (Students' Class), ditto, ditto. On the third day of the Show . .	3 0	2 0	1 0	0 10
270.—For	SHOE MAKING or TURNING, by Smiths under 25 years of age on the day of the competition, the patterns and descriptions of the Shoes to be supplied by the Judge, on the 4th day of the Show . . . . .	4 0	3 0	1 0	0 10
271.—For	SHOE MAKING or TURNING, by Smiths 25 years of age and over on the day of the competition, the patterns and descriptions of the Shoes to be supplied by the Judge, on the 4th day of the Show . . . . .	4 0	3 0	2 0	1 0

# CONDITIONS AND REGULATIONS FOR LIVE STOCK.

## GENERAL.

### ENTRIES.

1. The following are the Fees payable for Stock entries made on or before April 9. After that date and up to April 16, entries (except in the Harness, Saddle and Jumping Classes) will only be received on payment, in each case, of double the fee named below. *Exhibitors are requested to note that no exception can be made to this.* The entry fee is not returnable to an Exhibitor who enters an Animal in a Class for which it is ineligible, or for entries that are withdrawn after the date of entry has expired.

		MEMBERS.	NON-MEMBERS.	
		(see Reg. 5 below)		
Horses (see also Reg. 2 below)	for each Entry,			
including Horse Box	.. ..	30s.	..	60s.
Harness, Saddle and Jumping,	for each Entry			
without box	.. ..	5s.	..	10s.
Cattle, Sheep and Pigs	for each Entry	20s.	..	40s.
Goats	for each Entry	7s. 6d.	..	10s.

For particulars as to fees in the Dairy Herd, Produce, Butter-Making, Milking, Shoeing and Poultry Classes, see Entry forms.

2. Animals entered in the Harness, Saddle and Jumping Classes, and not having a box in the Yard, must be in the Yard by the time stated on the day on which they compete, and, with the consent of the Stewards, may leave the Yard as soon as they have been judged. Entries in these Classes, if no Horse Box is required, must reach the Secretary not later than 5 p.m. on the day previous to the competition for which the animal is entered. If a Box is required the entry must reach the Secretary on or before April 9, or at double fees as stated above, by April 16.

3. No Exhibitor can make more than three entries in any one Class of Horses, Cattle, Sheep, Goats or Pigs, except in the Harness, Saddle or Jumping Classes.

4. No Entry will be received unless the fee accompanies it, and (if the Exhibitor is a Member of the Society) the subscription for the year, unless previously paid, together with any arrears that may be due.

5. The privilege of entering at Members' fees is strictly limited to members of the Society, or of the Gloucestershire Agricultural Society or Somerset County Agricultural Association elected on or before January 25, 1921, and subscribing not less than £1 annually, or if elected after that date who has paid his subscription for 1921 and an additional £1 before the date of the closing of entries.

6. Where a Prize is offered for a *pair or pen* of Animals, single entry fees only are payable for each *pair or pen*, and only one entry form must be used.

7. All Entries must be made on the printed forms to be obtained of the Secretary (F. Holland Storr, 3, Pierrepont Street, Bath), and, in applying for Forms, Exhibitors are requested to state how many entries they wish to make of either Horses, Cattle, Sheep, Goats or Pigs, as each Stock entry must be made on a separate form.

8. Every Exhibitor or Competitor is requested to carefully examine the List of Prizes and Conditions, as he will be held responsible for the correctness of his Certificate of Entry. An Exhibitor omitting to give information asked for on the

entry form, with regard to the age, breeder, name, colour, sire, dam, &c., of an animal will be liable to have his entry disqualified, and if an exhibitor desires that his animal shall compete for any special prize offered, he must notify this on the entry form where requested to do so.

9. If an Exhibitor or Competitor fails, when called upon by the Stewards or Council, to prove the correctness of his Certificate of Entry to their satisfaction, the Entry may be disqualified and any award made to it cancelled.

10. An Exhibitor who has made, in due time, an entry of Horses, Cattle, Sheep, Goats or Pigs, in a particular class, will be permitted, up to Wednesday, April 27, to withdraw the entry of such animal, and to substitute for it the entry of another animal in the same class, on payment of the difference, if any, between the amount of the entry fee originally paid for the animal withdrawn, and the post entry fee. When, after entry, an animal dies, the exhibitor will be permitted to substitute another entry for it, in the same class, without payment of any further fee, upon affording evidence of death and furnishing particulars of the substituted entry in time for the alteration to be made in the published catalogue.

11. An animal can be entered in as many Classes as it is eligible for on payment of an additional fee in each Class. No additional fee is, however, payable in the case of Special or Champion Prizes for exhibits already entered in any particular Class.

12. Every exhibit must be the *bona fide* property of the Exhibitor both at the time of entry and on the first day of the Exhibition. For the purposes of this Meeting H.M. Officer's chargers will be considered as the property of the Officer in Classes 44, 50, 58 to 66 and 68.

#### SHOW YARD.

13. The Yard will be open for the reception of Horses (see Regulation 2 for Harness, Saddle and Jumping Horses), Cattle, Sheep, Goats and Pigs, on Saturday and Monday, May 28 and 30, from 7 a.m. to 6 p.m. Agricultural Horses and Hunters will also be received from 6 to 8 o'clock on the morning of the first day of Show, but all other Stock Entries (except Cobs and Ponies, which must be in the Yard before 8 a.m. on Thursday, June 2), must be in the Yard the previous day. A label denoting the number of each entry will be sent by the Secretary, and must be securely affixed to the head of the Animal. The carriage of exhibits must in all cases be paid by the Exhibitor. No exhibit subject to charges will be received by the Officers of the Society.

14. If an animal is brought into the Show Yard without having been entered for exhibition, the owner shall be liable to a fine of £2 and to the forfeiture of any prize awarded to him or her.

15. All Live Stock (see Conditions 2, 13 and 38 for exceptions with regard to Horses) must remain in their places in the Show Yard until after six o'clock in the afternoon of the last day of the Show, and shall under no circumstances be taken out of their places in the interval without the special permission of the Stewards.

16. During the time the Show is open to the public no rug or cloth shall be hung up so as to conceal any animal in a horse-box or stall, except with the special permission of the Steward of the department. All sheets used for the purpose must be removed before 9 o'clock on each day the exhibition is open to the public, and must not be replaced until after the closing hour of the Show each day.

17. All Exhibits and all persons in charge of the same, will be subject to the Orders, Regulations, and Rules of the Society, and the Stewards shall have the power to remove from the Yard the Stock or property belonging to, and to cancel the admission ticket of, any Exhibitor who shall infringe any of the Regulations or Conditions of the Meeting, or who shall refuse to comply with any instructions given by the Stewards, without any responsibility attaching to the Stewards or the Society in consequence of such removal.

18. No animal shall be decorated with colours other than the Society's Prize Rosettes.

19. No person shall be allowed to fix any placard, or to take down any official placard, in the Yard, without the written permission of the Stewards.

20. All persons in charge of Exhibits will be subject to the orders of the Stewards, and will be required to parade or exhibit the animals in their charge at such times as may be directed by the Stewards. Servants must be in attendance each day during the Show at least a quarter of an hour before the time appointed for exhibiting the animals under their charge in the Show rings. Servants in charge of animals must see that the animals' boxes or stalls are kept clean. No oil or cooking stove of any description must be lighted in the Horse Boxes and any one found offending in this respect will be dealt with in accordance with Regulation 33. Owners of animals exhibited will be held responsible for the behaviour of their Servants, and for the consequences of any misconduct of such Servants.

21. Servants in charge of Stock at night must, if they leave the yard, return before 10 p.m., or they will not be admitted.

22. On the day previous to the opening and on each day of the Show hay or green food and straw will be supplied by the Society free of expense to exhibitors at the Forage Stores in the Show Yard. Servants must apply at the Forage Stores for their Forage Tickets after they have brought their animals into the Yard. Corn, meal, and cake can be obtained in the Show Yard at fixed prices.

**NOTE.**—For the convenience of Exhibitors wishing to sell their animals, a Register will be kept at the Secretary's Office, in which they may enter the prices.

#### **TICKETS.**

23. Each Exhibitor of Live Stock whose entry fees amount to £1 and upwards will have a Free Ticket of admission to the Show Yard sent to him, except in the case of a Member, who will receive his Member's Badge in lieu of an Exhibitor's Ticket. Tickets for the use of Servants in charge of Live Stock remaining in the Yard will also be sent, and the Exhibitor will be held responsible for the proper use of such Tickets. In the case of animals not having a box in the Yard, a Servant's Ticket will not be required as the official label will admit the Driver or Rider, Horse and Vehicle into the Yard. In case of transfer or other improper use of a Ticket the Exhibitor will be required to pay a fine of £1 for each case. Exhibitors will be held responsible for the attendance at each Parade of as many Servants as Tickets have been issued for.

#### **RESPONSIBILITY.**

24. Neither the Society nor any of its Officers or Servants shall be in any way responsible or accountable for anything that may happen (from any cause or circumstance whatever) to Exhibitors or their Servants, or to any animal or article exhibited, or property brought into the Show Yard, or otherwise for anything else in connection with, or arising out of, or attributable to, the Society's Show, or these or any other Conditions or Regulations prescribed by the Society in relation thereto.

25. Each Exhibitor shall be solely responsible for any consequential or other loss, injury, or damage done to, or occasioned by, or arising from, any animal or article exhibited by him, and shall indemnify the Society against all legal or other proceedings in regard thereto.

26. The Society, its Officers and Servants, will not be liable for any errors or mistakes that may happen in placing or penning the Stock or Articles to be exhibited, but the Servants in charge of the same must see that they are placed or penned according to their entries.

**DISQUALIFICATION.**

27. The use of resin, soap, sawdust above the knee, or other substances designed to give an artificial appearance; cording; or any other improper means adopted in showing an animal in the Agricultural Horse Classes will be regarded as a disqualification.

28. No animal which has been exhibited as Fat Stock at any Show shall be eligible to compete for the Prizes offered in this Prize Sheet.

29. An animal having any unsoundness likely to be transmitted to its progeny shall be disqualified thereby from receiving any Prize offered by or through the Society.

30. If it shall be proved to the satisfaction of the Stewards or Council that an Exhibitor or Competitor has knowingly signed an incorrect Certificate, or knowingly given an incorrect Pedigree of any animal, or has attempted to enter an animal or other exhibit or to obtain a Prize by any other unfair means at this or any other Agricultural Society's Meetings, or is under exclusion from any Breed Society for fraudulent practices, the Council shall have the power to cancel all awards made to such Exhibitor or Competitor, to disqualify him or her from exhibiting or competing at future Meetings of the Society, and to inform other Agricultural Associations of their action in this respect.

**PENALTIES.**

31. As the non-exhibition of animals entered for the Show causes unnecessary preparations and expense, and disarranges the Show Yard, any person entering Stock, and failing to exhibit the same, shall pay a penalty of 10s. for each entry, unless a Certificate, under the hand of the Exhibitor or his authorised agent, be lodged with the Secretary of the Society, before the day of exhibition, certifying that such non-exhibition is caused either by—(1) the death of the animal or animals; or (2) contagious or infectious disease (confirmed by the explanatory certificate of a Veterinary Surgeon); or (3) by its becoming ineligible for the Class in which it has been entered. The fine is not remitted in the case of an exhibitor selling an animal between the time of entry and the date of the Show.

32. Every Exhibitor will be required to undertake to forfeit and pay to the Society the sum of £20, as and for liquidated damages, if any animal which he exhibits be, to his knowledge, suffering from any contagious or infectious disease, and the Stewards are empowered to prevent the entry of any diseased animal into the Yard, or to have it removed therefrom.

33. Any infringement of any of these or any other prescribed Regulations or Conditions will subject the Exhibitor to a fine of £1 by the Stewards, and to the forfeiture, by order of the Council, of any prize to which he may be entitled (in addition to all other consequences attaching to such infringement). The Council reserves to itself the right to inform other Agricultural Associations of any decision it may come to with respect to an Exhibitor.

**AWARDS.**

34. The Society reserves to itself the right to withhold any prize, if, in the opinion of the Stewards, the conditions and regulations have not been properly complied with, or if, in the opinion of the Judge, there is insufficient merit.

35. Only the signed awards of the Judges are accepted by the Society as evidence that a prize has been awarded, and the production of the prize card or the rosette by an Exhibitor will not entitle him to the prize.

36. The certificate of the Veterinary Inspector, whether as to age or soundness, shall be required only in cases where the Judges are in doubt, or where the Stewards may consider it necessary. (See also Regulation 46 with reference to

**Stallions and Mares.)** The decision of the Inspector in such cases shall be final and conclusive; and in case it shall be against the animal to which a Prize has been awarded, such animal shall be disqualified from receiving such Prize.

#### PROTESTS.

37. Any Exhibitor wishing to lodge a protest having reference to Live Stock exhibited at this meeting must make the same in writing on a form to be obtained from the Secretary, and deposit with him the sum of £3. If on investigation the protest is not sustained to the satisfaction of the Stewards, the sum thus deposited shall, at the discretion of the Council, be forfeited to the funds of the Society. All protests (except in the Harness, Saddle or Jumping Classes) must be delivered at the Secretary's Office in the Show Yard, on the day on which the award is made and no protest will be **SUBSEQUENTLY** received, unless a reason satisfactory to the Stewards be assigned for the delay. Any protest against an award in the Harness, Saddle or Jumping Classes must be made to the Steward in the ring immediately after the judging of the class to which it refers, and a deposit of £3 must, at the same time, be handed to the Steward. The Stewards will consider such protests at 11 o'clock on the following day at the Secretary's Office, at which time and place any person making a protest must attend or be represented by his authorised agent. The decision of the Stewards shall be final.

#### APPLYING TO CERTAIN CLASSES ONLY.

##### HORSES.

38. Horses can be removed from the Yard at night on deposit by the Exhibitor of £3 at the Finance Office, which sum will be forfeited if the Horse does not return at 8 a.m. each day during the Exhibition. This regulation does not apply to Animals not having a box in the Yard entered in the Harness, Saddle and Jumping Classes only.

39. Exhibitors must provide saddles for Horses in Classes 25 to 31, 44, 46, 50 and 58 to 68, as they are to be ridden; and vehicles and harness for those in Classes 43, 45, 47, 48, 49 and 51 to 57, which are to be driven.

40. No Horse, unless a Foal, will be admitted into the ring without a proper bit.

41. The Prizes for Stallions foaled before 1919 will be withheld until a certificate from the owner is delivered to the Secretary that the Horse has served at least 10 Mares during the current season.

42. All Foals must be the offspring of the Mares with which they are exhibited, and the name of the Sire of the Foal must be stated on the certificate of entry.

43. Mares entered as in-Foal shall, except as otherwise stated, hereafter be certified to have produced a living Foal before August 1st of the year of the Show. If the required certificate, which must be on a form obtainable from the Secretary, is not received by September 30, 1921, the prize awarded will be forfeited.

44. Horses may, at the discretion of the Stewards, be measured, and the measurement shall be taken in the shoes worn by the entry at the time of judging, and these shoes shall not be removed to allow of the entry being shown in another class.

45. In the Harness Classes for Hackneys exceeding 14 hands (except yearling colts and fillies) no shoe (nails included) may exceed 2 lbs. in weight, and for Ponies not exceeding 14 hands, yearling colts and yearling fillies, no shoe (nails included) may exceed 1½ lbs. in weight.

46. All Stallions and Mares (yearlings and foals excepted) to which prizes have been awarded in the breeding classes shall be examined by the Society's Veterinary Inspector, and unless pronounced free from indications of hereditary



disease shall be ineligible to receive the prize. The owner of an Animal rejected under this Regulation may, upon his application in writing to the Secretary, be furnished with a copy of the Veterinary Certificate. This Regulation shall not, however, apply to animals holding a Board of Agriculture Certificate for the current year.

47. The following special conditions apply only to the Prizes offered by the Shire Horse Society, viz.: the owner of the animal entered to have been a Member of the Bath and West and Southern Counties Society, for not less than six months previous to April 16, 1921; a Mare five years old, or upwards, must produce a living Foal in the current year, or have had a living Foal in the preceding year; in the case of in-Foal Mares a certificate of foaling must be lodged with the Secretary of the Shire Horse Society before the medal will be despatched. No animal to compete which has won the Shire Horse Society's Gold Medal during the current year; the Royal and London Shows being excepted; the winning animal to be entered, or eligible for entry, in the Shire Horse Society's Stud Book; and a certificate that the winner is free from hereditary disease signed by the Society's Veterinary Inspector after his examination on the Show Ground, must be lodged with the Secretary of the Shire Horse Society, but Stallions licensed by the Board of Agriculture, and Stallions, Mares and Fillies passed at the London Show, shall be exempt from further examination when selected for Medals during the current year. A prize of £5 will also be awarded to the breeder of the animal winning the Medal, provided that he is a member of the Shire Horse Society, and that the Dam is a Mare registered in the Shire Horse Stud Book. All awards must be completed within six months of the date upon which the Medal was awarded, or they will be void. The Council reserves the right to award the prizes only to persons approved by the Shire Horse Society and subject to confirmation in the uncontrolled discretion of the Council.

48. The following special conditions apply only to the Prize offered by the Hunters' Improvement and National Light Horse Breeding Society for Hunter Brood Mares, viz.:—The Mare awarded the Medal must possess a certificate of soundness from hereditary disease, signed by the Bath and West Society's appointed Veterinary Inspector, who must be a member of the Royal College of Veterinary Surgeons, after his examination of the animal on the Show Ground. Any Hunter Brood Mare, 8 years old or over, having been either awarded one of the Society's Gold Medals since 1911, or selected as Reserve for same, or having been passed sound after January 1, 1912, by a Veterinary Surgeon appointed by the Hunters' Improvement and National Light Horse Breeding Society, shall be exempt from further examination upon the owner producing at the time of exhibition the official veterinary certificate issued by the Secretary of that Society.

49. The following special conditions apply only to the Prize offered by the Hunters' Improvement and National Light Horse Breeding Society for best Mare or Gelding of any age. The Hunter awarded the medal must possess a certificate of soundness from hereditary disease, signed by the Bath and West Society's Veterinary Inspector, who must be a member of the Royal College of Veterinary Surgeons, after his examination of the animal on the Show Ground. The selected Mare, if unregistered, or the selected Gelding, if unentered, must be registered or entered within a month of the award in the Hunter Stud Book. No animal may take more than one of these medals in 1921.

NOTE.—No awards of the above-named Society's Prizes or Medals to a Hunter named and registered in the Hunter Stud Book and subsequently entered by the owner under another name, will be recognised or confirmed unless a re-entry has been previously lodged by the owner for the Hunter Stud Book and the new name registered by the Society.

50. The following special conditions apply only to the Silver Medal offered by the Hackney Horse Society in the Single Harness Classes:—All horses competing for the Medal must be *by a Registered Hackney Sire*. All geldings must be registered in the Stud Book. A certificate signed by the Breeder of the animal

must be forwarded to the Secretary of the Hackney Horse Society before the Medal is despatched. Each animal must be examined by a qualified veterinary surgeon on the Show Ground, and a certificate of soundness must be supplied. The Medal must be open to all Classes, and not confined to local competition, and the name and number of the sire, and the name and address of the breeder of each animal, should appear in the catalogue. No animal can take more than one Medal in any one year.

51. The following special conditions apply only to the Medals offered by the National Pony Society. Height of Stallions and Colts not to exceed 15 hands, and Mares and Fillies not to exceed 14.2, as confirmed by Hurlingham Certificate or that of a qualified Veterinary Surgeon. Ponies having previously won the National Pony Society's Gold Medal during the current year not to be eligible to compete, and no Pony is qualified to take more than one Silver Medal under the same scheme during any one year. The entry of the Winner must, if not already entered in the Supplement or Registered in the Stud Book, be duly lodged with the National Pony Society before the Medals will be despatched. All Brood Mares to have foal-at-foot or be due to foal in 1921, or if they have foaled in 1921 and the foal has died, a veterinary certificate to the effect that the foal was born alive to be provided. A medal will not be awarded unless there are at least 3 entries for it when drawn from more than one class, or in the case of a single class, unless there is a minimum of four entries in that class.

52. The following special conditions apply to Horses entered in the Jumping Competitions:—The jumps may consist of single hurdle, gate, double hurdle, bank, wall and water jump, at the discretion of the Judge and Stewards. Each horse competing shall have its catalogue number affixed to its breast in such a way that it may be easily seen by the general public. Each horse competing shall be ridden at the fences in the order announced by the Stewards. In case of a horse refusing his fence it shall be allowed two further trials, and *no more*. No change of rider shall take place during the competition. The Judge may take into consideration the style in which the fences are jumped, as well as the height and breadth, and his decision shall be final.

#### CATTLE.

53. All cattle must be properly secured to the satisfaction of the Officers of the Society on being brought to the gate of the Yard, or they will not be admitted.

54. All Bulls must have a ring or clamp attached to the nose, and, in the aged Classes, must be provided with a strong chain, and belled with a proper stick.

55. All cattle will be required to be paraded in the ring at least once a day at the discretion of the Stewards.

56. No Bull calved before January 1st, 1919, or in the Aberdeen-Angus Classes before December 1st, 1918, will be eligible to receive a Prize until certified to have served not less than six different Cows (or Heifers) previous to June 1st, 1921, and to be the sire of live calves dropped in the year 1921, or in the Aberdeen-Angus Classes after December 1st, 1920.

57. No Cow or Heifer, entered as in-milk, will be eligible to receive a Prize unless certified to have had a living Calf within the fifteen months preceding the date of the Show, or that the Calf, if dead, was born at the proper time.

58. Every Cow or Heifer in-milk shall be milked dry in the Show Yard at 7.30 p.m. on the evening preceding the day of judging, in the presence of an officer of the Society appointed for the purpose.

59. Any animal in the Cattle Classes found to be artificially coloured will be disqualified.

60. The milk yielded by Cows in the Show Yard must not be sold at the stalls, but will be purchased by the Society for the purposes of the Dairy at a price to

be agreed upon, and will be paid for on delivery at the Milk Receiving Office in the Dairy.

61. The following conditions apply only to the prizes offered for Pedigree Dairy Shorthorn and Devon Milking Cows:—The Cows and Heifers entered will be clean milked out at 6 o'clock on the evening preceding the opening of the Show to the satisfaction of the Stewards, and will be again milked in the ring on the first morning of the Show in the presence of the Judge, who shall see the Milk weighed, and any animal not yielding up to the following standard will not be awarded a prize:—

	Having Calved within 2 calendar months of the 1st day of the Show.		Having calved between 2 and 3 calendar months of the 1st day of the Show.		Having calved more than 3 calendar months of the 1st day of the Show.	
	lbs. of milk.		lbs. of milk.		lbs. of milk.	
	Shrthrus.	Dvns.	Shrthrus.	Dvns.	Shrthrus.	Dvns.
Cows, 5 years and upwards ..	30	22	27	21	24	18
Cows, 4 years and under 5 years..	26	20	23	20	20	17
Cows or Heifers, 3 years and under 4 years .. .. .	22	18	19	17	16	14
Heifers, under 3 years old ..	18	15	15	13	12	10

62. The following conditions shall apply only to the prizes offered for Pedigree Dairy Shorthorn Bulls:—No Bull is eligible to compete unless he has been registered or accepted for registration in the Year Book of the Dairy Shorthorn Association. The dam and sire's dam of the Bulls entered to have received, in or before 1918, a Certificate of Merit in Milking trials or tests recognised by the Dairy Shorthorn Association, or in an inspection class confined to Pedigree Dairy Shorthorns where the standard weight of milk has been a necessary qualification, or to hold a yearly record, published in the Association's Year Book, up to mid-day, October 1st, 1919, or after that date a record within 315 days after calving (published or accepted as eligible for publication as follows):—(1) Cows, 4 years old and upwards at date of calving, 8,000lbs.; (2) Cows, over 3 years old and under 4 years old at date of calving, 6,000lbs.; (3) Heifers, 3 years old and under at date of calving, 5,000lbs. No Bull having taken one of the Association's Prizes is eligible to compete again the same year, except at the R.A.S.E. Show. The prizes in this class will not be awarded unless there are at least three individual exhibitors. A certificate from the Dairy Shorthorn Association stating that the Bull is entered in their Register must be furnished by the exhibitor at the time of making the entry.

63. In the Kerry and Dexter Classes clipping (except in the case of a few hairs on the top of the tail) will disqualify an animal.

64. The following conditions apply to animals entered in the Milk and Butter Test Classes:—The date of last calving must be given on the entry form and, when an animal calves between the date of entry and that of the Show, notice of such calving must be sent to the Secretary or the animal may be disqualified. Points for Lactation will be allowed as follows:—One point for every completed 10 days since calving, calculated to the first day of the show, deducting the first 40 days. Maximum lactation points 12, but subject to the following conditions:—(a) Cows served within 90 days after calving, but not later, may obtain maximum points for lactation; (b) Cows which have calved 91 to 120 days and whose last service has been within that time, but not later, can only obtain a maximum of 8 points for lactation; (c) Cows not served within 120 days after calving can only obtain a maximum of 5 points for lactation; (d) Cows which have calved 121 to 150 days and whose last service has been within that time, but not later

can only obtain a maximum of 4 points for lactation ; (e) Cows not served within 150 days after calving can only obtain a maximum of 2 points for lactation ; (f) Cows which have calved 151 days or more, whether served or not after that time, will not receive any points for lactation. A certificate giving the last date of calving and the last date of service, and stating that the Cow has not broken her service since that date, signed by the Owner of the Cow exhibited or his Agent, to be delivered by the Herdsman to the Steward or Judge of the Test on or before the first day of the Show.

65. Except in the Local and Dairy Classes, every animal entered for competition must be entered, or certified as eligible to be entered, in the Herd Book of its Breed, where such Herd Book exists and has been in existence for not less than seven years, and all cattle must be tattooed in accordance with the rules of their respective Breed Societies, where such rules exist. Where an animal is entered by the Exhibitor as eligible for entry in the Herd Book of its breed, proof of such eligibility must be furnished to the Secretary at the time of making the entry.

#### SHEEP.

66. Each pen of Ewes must be of the same Flock.

67. The following conditions apply to the special prize offered by the South-down Sheep Society :—The sheep competing must be entered or eligible for entry in the Flock Book. In the Class for pairs of ram lambs, exhibitors will have the privilege of competing for the medal with any one of their exhibits.

68. Except in the Local Classes, every animal entered for competition must be entered or certified as eligible to be entered, in the Flock Book of its Breed, where such Flock Book exists and has been in existence for not less than seven years, and all Sheep must be tattooed in accordance with the rules of their respective Breed Societies where such rules exist. Where an animal is entered by the Exhibitor as eligible for entry in the Flock Book of its breed, proof of such eligibility must be furnished to the Secretary at the time of making the entry.

#### Pigs.

69. The pair of Pigs in each pen must be of the same litter.

70. All Sows farrowed before 1921 shall be certified to have had a litter of live Pigs within six months preceding the first day of exhibition, or to be in-Pig at the time of entering, so as to produce a litter of Pigs, farrowed at their proper time, before the 1st of September following. In the case of in-Pig Sows the Prize will be withheld until the Exhibitor shall have furnished the Secretary with a certificate of farrowing as above. If the required Certificate, which must be on a form obtainable from the Secretary, is not received on or before the 15th September following, the prize awarded will be forfeited.

71. All Pigs exhibited with a Sow shall be her own produce, of the same litter, and not exceeding two months old at the time of the Show.

72. No Sow above 18 months old that has not produced a litter of live Pigs shall be eligible to compete in any of the Classes.

73. Any animal in the Pig Classes found to be artificially coloured will be disqualified.

74. Should any question arise as to the age of any exhibit in the Pig Classes, the Stewards shall at the request of the Judge, have the state of their Dentition examined by a competent authority. If the state of the Dentition shall indicate that the age of any of the Pigs does not agree with the Dentition Test, the Stewards shall report the same to the Council, who shall have power to disqualify such Pig or Pigs. The following is the state of Dentition in Pigs which will be considered as indicating that they exceed the ages specified below :—Six Months : Pigs having

their corner permanent incisors cut will be considered as exceeding this age. **Nine Months :** Pigs having their permanent tusks more than half up, will be considered as exceeding this age. **Twelve Months :** Pigs having their central permanent incisors up, and any of the three first permanent molars cut, will be considered as exceeding this age. **Fifteen Months :** Pigs having their lateral temporary incisors shed, and the permanents appearing, will be considered as exceeding this age. **Eighteen Months :** Pigs having their lateral permanent incisors fully up will be considered as exceeding this age.

75. Except in the Local Classes, every animal entered for competition must be entered or certified as eligible to be entered in the Herd Book of its breed, where such Herd Book exists and has been in existence for not less than seven years and must conform to the rules of their respective Societies.

### HERDS, GOATS, CIDER, POULTRY, DAIRY PRODUCE, BUTTER- MAKING, MILKING AND SHOEING COMPETITIONS.

*For Conditions, Regulations and Entry Fees see entry form.*

### ADJUDICATION OF PRIZES

76. The Judges are instructed as follows, and entries are received subject to this :—

- a. Not to award any Prize or Commendation unless the entry possesses sufficient merit.
- b. Not to award a Prize to any Horse or Mare, unless it is free from unsoundness likely to be transmitted to its progeny ; or if a Gelding, unless free from unsoundness ; in either case, an accident having temporary consequences only excepted, and in awarding the Hunters' Improvement Society's Medals to give preference to animals showing weight-carrying properties.
- c. In awarding Prizes to Cattle, Sheep, and Pigs. to decide according to the relative merits of the animals for Breeding purposes, and not to take into consideration their present value to the butcher.
- d. To make the milking capacity and form of udder one of the chief points in awarding prizes to Cows and Heifers in milk.
- e. To draw the attention of the Stewards to any exhibit that has been improperly prepared for exhibition or is wrongly entered.
- f. To give in a "RESERVE NUMBER" in each Class, indicating the animal or exhibit which in their opinion possesses sufficient merit for the Prize, if the animal or exhibit to which the Prize is awarded should become disqualified. Should the "Reserved Number" succeed to a prize, and be itself disqualified, the prize will be forfeited.
- g. Immediately after the Judging to deliver to the Stewards their signed awards stating the numbers to which the Prizes are adjudged, and noting all disqualifications.

77. Should any question arise upon which the Judges may desire a further opinion, the Stewards shall provide them with a Referee.

### **PAYMENT OF PRIZES**

78. Cheques for the Prizes awarded (except where further qualification of an animal is required) will be drawn at the meeting of the Finance Committee held in July, 1921, and will then be forwarded by post to the Exhibitors to whom they have been awarded.

*Conditions and Regulations.*

## INTERPRETATION OF CONDITIONS.

79. The Society reserves to itself by its Council the sole and absolute right to interpret these or any other prescribed conditions and regulations, or Prize Sheets, and to arbitrarily settle and determine all matters, questions or differences in regard thereto, or otherwise arising out of or connected with or incident to the Show. Also to refuse and to cancel any entries, disqualify Exhibitors, prohibit exhibition of entries, vary or cancel awards of prizes or reserved numbers, and relax conditions, as the Society may deem expedient

## POULTRY.

Entry Fees: Class 1, Members, 4/-; Non-Members, 6/-;  
Other Classes, Members, 3/-; Non-Members, 4/-  
each entry.

Judges—G. DOBLE, Royal Ashton Hotel, Taunton  
(Classes 1 to 23, 50 to 53 and 58 to 71); and C. H.  
HOUSE, 152, Stapleton Hall Road, Stroud Green,  
London, N.4 (Classes 1, 24 to 49 and 54 to 71).

(Under Poultry Club Rules.)

*The Birds in Classes 1 to 49 must have been hatched  
previous to January 1st, 1921.*

## CLASS.

	First Prize.	Second Prize.	Third Prize.
£ s.	£ s.	£ s.	
1.—Any Pure Breed, best mated to produce Table Poultry.—Cock and 3 Hens, bred in 1919 or 1920, the property of one Exhibitor .. .. .	3 0	2 0	1 0
2.—COCHIN or BRAHMA—Cock .. .. .	1 0	0 15	0 10
3.—Ditto—Hen .. .. .	1 0	0 15	0 10
4.—PLYMOUTH ROCK—Cock .. .. .	1 0	0 15	0 10
5.—Ditto—Hen .. .. .	1 0	0 15	0 10
6.—ORPINGTON (Buff)—Cock .. .. .	1 0	0 15	0 10
7.—Ditto—Hen .. .. .	1 0	0 15	0 10
8.—ORPINGTON (Black)—Cock .. .. .	1 0	0 15	0 10
9.—Ditto—Hen .. .. .	1 0	0 15	0 10
10.—ORPINGTON (White)—Cock .. .. .	1 0	0 15	0 10
11.—Ditto—Hen .. .. .	1 0	0 15	0 10
12.—MINORCA—Cock .. .. .	1 0	0 15	0 10
13.—Ditto—Hen .. .. .	1 0	0 15	0 10
14.—RHODE ISLAND RED—Cock .. .. .	1 0	0 15	0 10
15.—Ditto—Hen .. .. .	1 0	0 15	0 10
16.—SUSSEX (Speckled)—Cock .. .. .	1 0	0 15	0 10
17.—Ditto—Hen .. .. .	1 0	0 15	0 10
18.—SUSSEX, any other colour, Cock or Hen .. .. .	1 0	0 15	0 10
19.—DORKING (Any variety)—Cock .. .. .	1 0	0 15	0 10
20.—Ditto—Hen .. .. .	1 0	0 15	0 10
21.—FAVEROLLES—Cock or Hen .. .. .	1 0	0 15	0 10
22.—LANGSHAN—Cock .. .. .	1 0	0 15	0 10
23.—Ditto—Hen .. .. .	1 0	0 15	0 10
24.—WYANDOTTE (Silver or Gold Laced)—Cock .. .. .	1 0	0 15	0 10
25.—Ditto—Hen .. .. .	1 0	0 15	0 10
26.—Ditto (White)—Cock .. .. .	1 0	0 15	0 10
27.—Ditto—Hen .. .. .	1 0	0 15	0 10
28.—Ditto (Black)—Cock .. .. .	1 0	0 15	0 10
29.—Ditto—Hen .. .. .	1 0	0 15	0 10
30.—Ditto (Any other colour)—Cock .. .. .	1 0	0 15	0 10
31.—Ditto—Hen .. .. .	1 0	0 15	0 10
32.—LEGHORN (White)—Cock .. .. .	1 0	0 15	0 10
33.—Ditto—Hen .. .. .	1 0	0 15	0 10
34.—Ditto (Any other colour)—Cock .. .. .	1 0	0 15	0 10
35.—Ditto—Hen .. .. .	1 0	0 15	0 10
36.—HAMBURG (Black)—Cock .. .. .	1 0	0 15	0 10
37.—Ditto—Hen .. .. .	1 0	0 15	0 10

CLASS.	POULTRY—continued.			First Prize.	Second Prize.	Third Prize.
				£ s.	£ s.	£ s.
38.—Ditto (Any other colour)—Cock .. .. .	..	..	..	1 0	0 15	0 10
39.—Ditto—Hen .. .. .	..	..	..	1 0	0 15	0 10
40.—OLD ENGLISH GAME (Black Red)—Cock .. .. .	..	..	..	1 0	0 15	0 10
41.—Ditto—Hen .. .. .	..	..	..	1 0	0 15	0 10
42.—Ditto (Any other colour)—Cock .. .. .	..	..	..	1 0	0 15	0 10
43.—Ditto—Hen .. .. .	..	..	..	1 0	0 15	0 10
44.—INDIAN GAME—Cock .. .. .	..	..	..	1 0	0 15	0 10
45.—Ditto—Hen .. .. .	..	..	..	1 0	0 15	0 10
46.—FRENCH (excluding Faverolles)—Cock .. .. .	..	..	..	1 0	0 15	0 10
47.—Ditto—Hen .. .. .	..	..	..	1 0	0 15	0 10
48.—ANY OTHER DISTINCT BREED not previously men-	..	..	..	1 0	0 15	0 10
49. tioned—Cock .. .. .	..	..	..	1 0	0 15	0 10
.—Ditto—Hen .. .. .	..	..	..	1 0	0 15	0 10

### SELLING CLASSES.

50.—ANY DISTINCT BREED—Cock or Cockerel ( <i>Price not to exceed £1 1s.</i> ) .. .. .	1 0	0 15	0 10
51.—ANY DISTINCT BREED—Hen or Pullet ( <i>Price not to exceed £1 1s.</i> ) .. .. .	1 0	0 15	0 10

### CHICKENS OF 1921.

52.—COCHIN, BRAHMA, PLYMOUTH ROCK, ORPINGTON, LANGSHAN, SUSSEX or DORKING—Cockerel .. .. .	1 0	0 15	0 10
53.—Ditto—Pullet .. .. .	1 0	0 15	0 10
54.—MINORCA, WYANDOTIE, LEGHORN, HAMBURG, FAVEROLLES or FRENCH—Cockerel .. .. .	1 0	0 15	0 10
55.—Ditto—Pullet .. .. .	1 0	0 15	0 10
56.—GAME, MALAY, or any other Distinct Breed not previously mentioned—Cockerel .. .. .	1 0	0 15	0 10
57.—Ditto—Pullet .. .. .	1 0	0 15	0 10

### LIVE TABLE POULTRY.

58.—Pair of COCKERELS of any Pure Breed, hatched in 1921..	1 0	0 15	0 10
59.—Pair of PULLETS of any Pure Breed, hatched in 1921 ..	1 0	0 15	0 10
60.—Pair of Cross-Bred COCKERELS, hatched in 1921 ..	1 0	0 15	0 10
61.—Pair of Cross-Bred PULLETS, hatched in 1921 ..	1 0	0 15	0 10

### SPECIAL PRIZES.

Offered by the Poultry Club.

**BATH AND WEST AND SOUTHERN COUNTIES CUP** (Value £10 10s.)

For the Best Bird in the Show, the property of a Member of the Poultry Club. The Cup to be won three times, not necessarily in succession, by the same exhibitor before becoming his absolute property.

A Silver Egg Cup for best Cock or Cockerel in the Poultry Classes, the property of a Member of the Poultry Club.

„ „ „ Hen or Pullet, ditto, ditto

The Associated Society's Bronze Medal for the Best Bird in the Show (Winner need not be a Member of the Poultry Club).



<b>POULTRY—continued.</b>						First Prize.	Second Prize.	Third Prize.
						£ s.	£ s.	£ s.
<b>DUCKS, GEESE AND TURKEYS.</b>								
<b>CLASS.</b>								
62.—	DRAKE or DUCK	(Aylesbury)	..	..	..	1 0	0 15	0 10
63.—	"	" (Rouen)	..	..	..	1 0	0 15	0 10
64.—	"	" (Pekin)	..	..	..	1 0	0 15	0 10
65.—	GANDER or GOOSE	..	..	..	..	1 0	0 15	0 10
66.—	TURKEY—Cock or Hen	..	..	..	..	1 0	0 15	0 10
<hr/>								
<b>DEAD TABLE POULTRY.</b>								
<i>(To be forwarded killed and plucked)</i>								
67.—	Pair of	COCKERELS of 1921 of any Pure Breed	..	..	..	1 0	0 15	0 10
68.—	"	PULLETS " " "	..	..	..	1 0	0 15	0 10
69.—	Pair of	Cross-bred COCKERELS of 1921	..	..	..	1 0	0 15	0 10
70.—	"	" PULLETS	..	..	..	1 0	0 15	0 10
71.—	Pair of	DUCKLINGS of 1921	..	..	..	1 0	0 15	0 10

## POULTRY

*(Under Poultry Club Rules.)*

## CONDITIONS AND REGULATIONS.

## CHARGES, &amp;c.

1. Exhibitors may make an unlimited number of Entries on payment of fees as follows :—

		MEMBERS.		NON MEMBERS.	
		s.	d.	s.	d.
For each entry (Class 1)	.. ..	4	0	6	0
.. (other Classes)	.. ..	3	0	4	0

The above fees include coops, food, and attendance.

N.B.—The above fees *must* be sent with the entries, or no notice will be taken of the latter.

2. The privilege of entering at Member's fees is strictly limited to Members of the Bath and West Society, or of the Gloucestershire Agricultural Society, or Somerset County Agricultural Association elected on or before January 25, 1921, and subscribing not less than £1 annually.

3. All entries must be made on the printed forms to be obtained of the Secretary (F. H. STORR, 3, Pierpont Street, Bath), and such forms must be correctly filled up and returned to the Secretary, together with all fees due, on or before May 7. Exhibitors are requested to carefully examine the List of Prices and Conditions, as the Society cannot be responsible for any errors made by Exhibitors in the entry forms, and birds entered in a wrong Class will be necessarily excluded from competition. No alterations can be made in entry forms after they have been received by the Secretary.

4. The Council reserve the right to refuse the entries of any person.

5. Exhibitors must state the price and breed of their birds on their entry forms.

## SHOW YARD.

6. All birds must be in the Show Yard by 6 p.m. on *Monday, May 30*, and no bird can be removed before 7 p.m. on *Saturday, June 4*. Any Exhibitors who send for their birds must do so between 7 and 8 p.m. on that day.

7. All carriage must be prepaid to Bristol Railway Station, otherwise the birds will not be received at the Exhibition; but they will be conveyed free of expense from the Station to the Show Yard and back.

8. No Exhibitor or Servant will be allowed into the tent until the birds have been judged.

9. The Poultry Tent will not be open to the public until 2 o'clock on the first day of the Exhibition.

10. A Non-Transferable Admission Ticket for the Exhibition will be sent to each Exhibitor whose entry fees amount to £1 and upwards.

## TABLE POULTRY.

11. In these Classes (58 to 61 and 67 to 71), quality for the table will be considered before mere weight. The date of hatching must be given and, in the case of cross bred birds, the breeds of the parents.

12. In Classes 67 to 71 the Birds must be sent killed and plucked. They will be withdrawn from exhibition when considered necessary, and, if unsold, will be

returned to Exhibitors after 6 p.m. on Thursday, June 2. Exhibitors are recommended to put a reasonable price upon their exhibits in these Classes so as to promote the sale of them.

#### SALES.

13. All birds may be claimed, at the price put upon them, any time after 4 o'clock on Tuesday, May 31, and a sale *must take place* if the price stated be paid to the Clerk in the Poultry Office at the time of claiming. *No alteration can be made in the prices stated on the entry forms* and in the Catalogue until after Thursday, June 2, when the price may be reduced on payment to the Steward of one shilling per pen on each alteration. Birds must be *sold in pens*, and the price stated must include the basket. Birds entered in selling classes must be sent in separate hampers. A charge of 10 per cent. will be made for all birds sold. The persons who have the management of the sales cannot take charge of birds which are disposed of privately.

#### AWARDS.

14. No second prize will be given in any of the Classes unless there are three entries, and no third prize unless there are six entries.

#### DISQUALIFICATION.

15. The Judges are empowered to withhold a prize or prizes where the birds are not considered of sufficient merit, or in the chicken classes where they consider them over age, and are instructed to disqualify any that have been clipped, drawn, trimmed, marked, or dyed. In the Game Classes birds can be shown either dubbed or undubbed.

16. An Exhibitor detected in a false statement as to the age, etc., of any bird, or in any other practice calculated to deceive or mislead the Judges or Stewards, shall forfeit all or any prizes awarded to him or her at the Show, and will be disqualified from competing at any future Show of the Society, and the Council shall have power to inform other Societies of their action in this respect.

17. No person who shall have been shown to the satisfaction of the Council to have been excluded from exhibiting for Prizes at the exhibition of any other Society in consequence of having attempted to obtain a Prize by giving a false Certificate, or by other unfair means, and no person who is under exclusion from any Breed Society for fraudulent practices, shall be allowed to exhibit at this or any other Meeting of the Society.

18. Unhealthy birds will not be exhibited, but will be immediately returned to their owners, and the fees will be forfeited.

#### PROTESTS.

19. In order to check frivolous and vexatious protest, no protest will be entertained unless accompanied by a deposit of £1 in each case; and in case the protest is not substantiated the deposit may be forfeited to the Funds of the Society. All protests must be made before 12 o'clock (noon) on Wednesday, June 1.

#### FORFEITS.

20. Persons entering birds and failing to send the same to the Exhibition will forfeit the entrance fee for each pen so left vacant.

#### GENERAL.

21. All birds shown must be *bona fide* the property of the Exhibitor.

22. For each pen entered the Exhibitor will receive a label, on the reverse side of which he must legibly write his name and address for the return journey.

23. All eggs laid at the Exhibition will be destroyed.

24. The Stewards pledge themselves to take every care of the birds exhibited, but neither they nor the Society will, in any case, be responsible for any accident loss or damage, from whatever cause arising, the exhibits being entered at the sole risk of the Exhibitors, and Exhibitors will be required to hold the Society harmless in the event of loss.

25. In case of death of any bird during the Exhibition, it will be sent back for the inspection of the Exhibitor.

26. The Poultry Department is subject to the Rules and Regulations of the Society and its officers.

*\*\* The use of properly-constructed Poultry Baskets will facilitate the safe and speedy conveyance of the birds to and from the Exhibition and all Birds entered in selling Classes must be sent in separate hampers.*

*The Society cannot, under any circumstances, undertake to send telegrams to Exhibitors as to Judges awards.*

*Applications for Catalogues and printed lists of awards should be made only to the Publishers, MESSRS. W. LEWIS & SONS, Herald Office, Bath.*

*By order of the Council.*

3, Pierrepont Street, Bath.

**F. H. STORR, Secretary.**

TELEGRAPHIC ADDRESS:—"AGRICULTURE, BATH."

TELEPHONE No 610.

# FINANCIAL STATEMENTS

FOR

1920

*WITH ITEMS OF 1915 FOR COMPARISON*

	PAGES
SUMMARY OF CASH ACCOUNT	cxlviii-cxlix
ANNUAL CASH ACCOUNT ...	cl-clix
ASSETS AND LIABILITIES ACCOUNT .. .	clx
FINANCIAL RESULT OF SHOW ...	clxi

# The Bath and West and SUMMARY OF THE CASH ACCOUNT WITH COMPARATIVE

Page of accompany- ing Cash Account.	RECEIPTS.	1920. SALISBURY.			1915. WORCESTER.		
		£	s.	d.	£	s.	d.
	General:—						
cl	Dividends and Interest . . . . .	799	0	2			
cl	General Receipts . . . . .	1	16	0			
cl	Subscriptions from Members . . . . .	910	17	0			
cl	Life Members . . . . .	160	0	0			
cl	Journal . . . . .	82	8	10			
					1,893	11	0
	Show:—						
clli	Implements . . . . .	3,118	16	8			
clli	Horses . . . . .	1,247	9	6			
clli	Cattle, Sheep and Pigs . . . . .	2,410	2	0			
clli	Catalogues, Fodder Sales, &c. . . . .	143	5	3			
cliv	Poultry . . . . .	77	7	3			
cliv	Shoeing . . . . .	37	0	0			
cliv	Nature Study and Handicrafts . . . . .	23	6	0			
clvi	Cheese and Butter . . . . .	83	15	0			
clvi	Working Dairy . . . . .	244	2	8			
clvi	Cider . . . . .	12	5	0			
clvi	Bottled Fruit . . . . .	8	10	0			
cl i	Admissions . . . . .	6,237	10	0			
clviii	Unapportionable:—						
	Contract Premiums and Cloak Rooms . . . . .	465	18	11			
	Sales and Fittings . . . . .	416	11	10			
		882	10	9			
clviii -	Subscription from Bristol for 1921 Show . . . . .	800	0	0			
					15,326	0	1
					17,219	11	1
clviii	Deposit returned . . . . .						
clviii	Balance in Bank, January 1st . . . . .				55	17	9
clviii	Balance due to Bank, December 31st . . . . .				1739	14	1
					£ 19,016	2	11

**Southern Counties Society.****FOR THE YEAR ENDING DEC. 31st, 1920.****STATEMENT FOR 1915.****CR.**

Page of accompany- ing Cash Account.	PAYMENTS.	1920. SALISBURY.		1915. WORCESTER.	
		£ s. d.	£ s. d.	£ s. d.	
	<b>General:—</b>				
cli	Salaries . . . . .	1,156 0 9		1,100 0 0	
cli	Printing, Postage, Stationery, &c. . . . .	722 15 7		347 9 11	
cli	Journal . . . . .	603 5 11		413 10 0	
			2,482 2 3	1,860 19 11	
	<b>Show:—</b>				
clm	Implements . . . . .	1,738 1 0		559 7 11	
		£ s. d.			
clih	Horses . . . . .	1,729 13 0		1,235 7 11	
cllii	Cattle, Sheep and Pigs . . . . .	3,448 10 6		2,301 2 5	
cllii	Fodder, &c. . . . .	1,234 0 8		487 0 2	
		6,412 4 2		4,023 10 6	
clv	Poultry . . . . .	373 11 5			
clv	Shoeing . . . . .	244 16 1			
clv	Nature Study and Handicrafts . . . . .	249 18 7			
clv	Forestry . . . . .	256 9 3		5 10 0	
clv	Music . . . . .			149 12 5	
clv	Horticulture . . . . .	319 3 6		159 9 11	
clv	Bees . . . . .			2 12 6	
clvii	Cheese and Butter . . . . .	250 13 9		184 7 5	
clvii	Working Dairy . . . . .	936 15 9		446 6 6	
clvii	Older . . . . .	154 3 1		88 8 6	
clvii	Bottled Fruit . . . . .	18 0 10			
clvii	Public Announcements . . . . .	705 11 10		427 17 8	
clix	<b>Unapportionable:—</b>				
	Erection of Offices, &c. . . . .	3,203 0 6		1,112 0 10	
	Carriage of Plant . . . . .	159 2 8		135 9 6	
	Stand Fittings . . . . .	234 10 0		127 19 5	
	Police . . . . .	540 16 1		301 0 4	
	Miscellaneous . . . . .	603 2 2			
		4,740 11 5		1,676 9 7	
			16,400 0 8	7,723 12 11	
clix	<b>Experiments:—</b>		100 0 0	100 0 0	
				18,982 2 11	9,884 12 10
clix	<b>Investments . . . . .</b>		34 0 0		
clix	Balance due to Bank, Jan. 1st . . . . .			58 16 5	
			£ 19,016 2 11	9,743 8 8	

January 17th, 1921.

Audited and found correct,

F. CLIFFORD GOODMAN, F.C.A.,

Auditor.

Passed by Council,  
January 25th, 1921.

F. H. STORR,

Secretary.

## The Bath and West and

## Dr. CASH ACCOUNT FOR THE YEAR ENDING DEC. 31st,

RECEIPTS.	1920 SALISBURY			1915 WORCESTER		
	£	s	d	£	s	d
DIVIDENDS AND INTEREST —						
Consols					129	0 2
War Loan Stock	20	9	6		74	9 8
Ditto (to replace Capital lost by Conversion)	6	19	0			
South Australian Stock	29	0	4		36	14 0
New Zealand Stock	38	8	4		48	11 10
India Stock	1	8	6 4		200	4 10
Queensland Stock	46	3	8		97	8 11
New South Wales Stock	49	1	4		62	1 3
Canadian Pacific Railway Stock	47	5	0		53	5 0
Interest on Deposit					19	8 11
	580	13	6			
Income Tax returned	157	15	8			
				738	9	2
GENERAL RECEIPTS —						
Telephone Wav leave	0	1	0		0	1 0
Cancelled Cheques etc	1	15	0		0	9 9
				1	16	0
SUBSCRIPTIONS FROM MEMBERS —						
Arrears	20	16	0		30	18 0
Governors	149	18	0		160	11 0
Subscribers of £1 and upwards	724	3	0		748	9 0
10s	7	0	0		7	0 0
				910	17	0
				946	18	0
LIFE COMPOSITIONS —						
				180	0	0
				20	0	0
JOURNAL —						
Sales	4	15	1		3	14 7
Advertisements	77	13	9		29	18 8
				82	8	10
				38	8	9
Carried forward	£	1893	11 0			



**Southern Counties Society.****1920, WITH COMPARATIVE STATEMENT FOR 1915****CR**

PAYMENTS	1920 SALISBURY			1915 WORCESTER		
	£	s	d	£	s	d
<b>SALARIES —</b>						
Secretary (the late), including clerk to						10 0 0
Secretary	50	0	0			
Assistant Secretary	400	0	0			
Office Staff	151	0	9			
Auditor	25	0	0			20 0 0
Consulting Chemist	30	0	0			30 0 0
				1156	0	9
						1100 0 0
<b>MISCELLANEOUS —</b>						
Printing	53	17	0			15 9 5
Stationery and Finance Books	57	17	11			28 19 4
Postages Telegrams Cheque and Receipt Books	91	15	8			56 15 6
Ground Rent and Rates	30	19	4			22 14 2
Property Tax	11	5	0			3 2 5
Travelling Expenses	43	3	3			22 0 2
Carriage of Goods	3	17	4			11 13 4
Directories and Reference Books	0	8	0			2 2 7
Subscriptions	8	17	0			7 12 0
Repairs and Fittings	58	18	3			5 17 6
Hire of Council Rooms	1	1	0			5 3 0
Fuel and Light	5	1	7			6 16 1
Finance and other Committees Expenses	5	11	6			11 1 10
Telephone	7	16	0			7 16 0
Bank Charges	20	6	0			39 0 0
Council Grants and Allowance to Widow of late						
Secretary	275	0	0			100 0 0
Miscellaneous						1 6 7
				722	1	7
						347 0 11
<b>JOURNAL —</b>						
Editor	100	0	0			100 0 0
Associate Editor	25	0	0			100 0 0
Printing and Binding	377	1	6			140 8 10
Plans and Blocks	20	4	0			14 3 10
Journal Distribution	27	0	8			17 12 8
Postages, Stationery, Reference Books, etc	7	0	9			4 10 8
Payments to Authors	46	19	0			36 14 0
				608	5	11
						413 10 0
Carried forward	£	2,182	2 9			

Dr.

CASH ACCOUNT—*continued.*

RECEIPTS.	1920 SALISBURY			1915. WORCESTER.		
	£	s	d.	£	s	d.
Brought forward				1,893	11	0
IMPLEMENTS —						
Fees for Space —						
Machinery-in-Motion Shedding	1,184	15	0			394 10 0
Ordinary	474	0	0			229 10 0
Miscellaneous	303	15	0			109 5 0
Boarded	708	15	0			367 2 6
Seed	78	5	0			19 0 0
Uncovered Ground	213	0	2			161 3 0
Catalogue Fees	84	17	0			68 15 6
Entry Fees	71	0	0			50 18 6
				3,119	16	8
HORSES, CATTLE, SHEEP AND PIGS —						
Horses — Entry Fees	457	17	6			266 7 0
Fines	2	10	0			4 10 0
Grand Stand Admissions	794	2	0			226 4 0
Special Prizes	93	0	0			79 0 0
	1,247	9	6			576 1 6
CATTLE, SHEEP AND PIGS —						
Entry Fees	1,644	12	0			467 18 0
Fines	31	0	0			31 0 0
Special Prizes	734	10	0			438 0 0
	2,410	2	0			936 18 0
Catalogues, Manure and Fodder	110	13	3			100 9 1
Advertisement in Prize List	12	12	0			
	113	5	3			
				3,800	16	0
						1,613 8 7
Carried forward	£	8,813	4	5		

**CASH ACCOUNT—continued.****CR.**

PAYMENTS.	1920 SALISBURY			1915 WORCESTER.		
	£	s	d	£	s	d
Brought forward				2,492	2	3
<b>IMPLEMENTS. —</b>						
Shedding	1,568	19	1	486	4	3
Stewards and Assistants	68	5	6	48	0	10
Printing, Stationery, etc	68	19	9	20	16	4
Fees returned	11	16	8	4	6	6
				1,738	1	0
<b>HORSES, CATTLE, SHEEP AND PIGS. —</b>				559	7	11
Horses Prizes	5728	16	8	731	0	0
Fees deferred	11	0	0			
	717	16	8	422	16	6
Shedding & Grand Stand	878	16	8	61	5	1
Stewards and Assistants	81	0	0	18	6	4
Judges	48	19	8	2	0	0
Fees returned				1,215	7	11
	1,729	13	0			
Cattle Prizes	1,239	5	0	1,021	0	0
Sheep Prizes	588	0	0	552	0	0
Pig Prizes	249	5	0	187	0	0
Shedding and Canvas	1,175	16	6	389	12	1
Stewards and Assistants	43	5	2	43	0	9
Judges	142	15	10	102	4	7
Fees returned	9	0	0	2	10	0
Miscellaneous	1	5	0	3	15	0
	3,448	10	6	2,301	2	5
Buildings, etc	669	18	1	239	3	3
Fodder and Insurance	245	18	4	174	0	6
Fodder Assistants	30	0	9	8	6	7
Veterinary Inspector	20	0	6	5	5	0
Rosettes	18	16	5	11	17	1
Printing and Stationery	124	14	10	18	14	7
Refreshments to Judges	15	5	6	0	13	2
	1,234	0	8	487	0	2
				6,412	4	2
				4,023	10	6
Carried forward				£10,832	7	5

Dr.

CASH ACCOUNT—*continued.*

RECEIPTS.	1920 SALISBURY			1915 WORCESTER		
	£	s	d	£	s	d
Brought forward				8,813	4	5
POULTRY.—						
Entry Fees	71	16	0			
Commission on Sales	1	11	3			
Special Prizes	4	0	0			
				77	7	3
SHOEING						
Entry Fees	19	0	0			
Special Prizes	18	0	0			
				37	0	0
NATURE STUDY AND HANDICRAFTS						
Fees for Space	19	16	0			
Donations	3	10	0			
				23	6	0
Brought forward				£ 8,950	17	8

**CASH ACCOUNT—continued.****CR.**

<b>PAYMENTS.</b>	<b>1920. SALISBURY.</b>		<b>1915. WORCESTER.</b>
	<b>£ s. d.</b>	<b>£ s. d.</b>	<b>£ s. d.</b>
Brought forward . . . . .		10,632 7 5	
<b>POULTRY :—</b>			
Sheds, Staging, Pens and Runs . . . . .	168 19 7		
Steward and Assistants . . . . .	36 0 10		
Judges . . . . .	10 18 0		
Prizes . . . . .	124 5 0		
Printing, Stationery, Cartage, Food, etc. . . . .	33 8 0		
		373 11 5	
<b>SHOEING :—</b>			
Prizes . . . . .	36 10 0		
Judges . . . . .	8 13 6		
Anvils, Forges, Coals, Horses Printing, etc. . . . .	44 15 9		
Shedding . . . . .	109 14 5		
Stewards and Assistants . . . . .	15 12 5		
Fees returned . . . . .	9 10 0		
Exhibition of Models . . . . .	20 0 0		
		244 16 1	
<b>NATURE STUDY AND HANDICRAFTS :—</b>			
Labour and Fittings . . . . .	222 3 11		
Steward and Assistants . . . . .	17 10 11		
Printing, Postage, etc. . . . .	10 3 9		
		249 18 7	
<b>FORESTRY :—</b>			
Labour and Fittings . . . . .	220 5 6		
Steward and Assistants . . . . .	10 0 3		0 10 0
Printing, Postage, etc. . . . .	8 17 6		
Prizes . . . . .	12 6 0		
Demonstrator . . . . .	5 0 0		5 0 0
		256 9 .	5 10 0
<b>MUSIC :—</b>			149 12 5
<b>HORTICULTURE :—</b>			
Gratuities to Gardeners . . . . .	150 0 0		100 0 0
Erecting and Repairing Tent and Staging . . . . .	140 2 0		39 12 2
Steward and Assistants, Printing, etc. . . . .	23 1 6		10 17 0
		310 3 6	150 9 11
<b>BEEES :—</b>			2 12 6
Carried forward . . . . .	£ 12,076 6 3		

Dr.

## CASH ACCOUNT—continued.

RECEIPTS.	1920. SALISBURY.		1915. WORCESTER.	
	£	s. d.	£	s. d.
Brought forward . . . . .			8,950	17 8
CHEESE AND BUTTER :—				
Entry Fees . . . . .	47	7 0		37 5 0
Sales . . . . .	22	3 0		15 8 11
Special Prizes and Fines . . . . .	14	5 0		0 5 0
			83	15 0
WORKING DAIRY :—				
Admissions . . . . .	6	19 6		2 5 3
Entry Fees, Competitions . . . . .	£22	18 0		42 10 0
„ Appliances . . . . .	7	7 0		5 5 0
„ Tests . . . . .	80	0 0		9 0 0
			110	5 0
Sale of Produce . . . . .	108	8 2		21 4 0
Special Prizes, etc. . . . .	18	10 0		65 0 0
			244	2 8
CIDER :—				
Entry Fees . . . . .			12	5 0
BOTTLED FRUIT : -				
Entry Fees . . . . .	1	10 0		
Special Prizes . . . . .	7	0 0		
			8	10 0
ADMISSIONS —				
Admissions at 4s. (Worcester, 2s. 6d.). . . . .	3,580	0 0		889 12 6
„ „ 2s. ( „ 1s.) . . . . .	2,354	10 0		1,277 4 0
„ „ 1s. ( „ 6d. and 3d.) . . . . .	145	0 0		73 19 0
Season Tickets, etc. . . . .	158	0 0		49 17 0
(a)			6,237	10 0
Carried forward . . . . .	£	15,537 0 4		

**CASH ACCOUNT—continued.****CR.**

PAYMENTS.	20.			1915.					
	SALISBURY.			WORCESTER.					
	£	s.	d.	£	s.	d.			
Brought forward				12,076	6	3			
<b>CHEESE AND BUTTER:—</b>									
Judges		9	18	0	8	8	4		
Prizes		100	10	0	122	0	0		
Stewards and Assistants		18	8	0	8	10	0		
Shedding and Staging		114	11	8	39	14	10		
Printing, Stationery, Carriage, etc.		7	5	4	5	14	3		
				250	13	0	184	7	5
<b>WORKING DAIRY:—</b>									
Stewards and Assistants		68	8	6	27	0	1		
Judges and Demonstrators		54	12	5	66	3	4		
Buildings		441	0	2	203	9	0		
Printing, Stationery, Postages, etc		9	5	5	4	8	2		
Utensils, Carriage, etc.		203	4	7	38	7	9		
Prizes		61	11	6	85	0	0		
Coal, Salt, Ice, etc.		10	10	4	13	17	7		
Consulting Chemist for Analyses		22	5	6	8	0	7		
Purchase of Milk		65	19	4					
				936	15	9	446	6	0
<b>CIDER:—</b>									
Shedding and Fittings		67	12	9	24	5	5		
Steward and Assistants		25	8	7	14	5	0		
Judge		4	11	0	3	17	2		
Prizes		30	0	0	26	17	0		
Analyses, Carriage, Printing, etc		26	10	9	19	3	11		
				154	3	1	88	8	6
<b>BOTTLED FRUITS:—</b>									
Shedding and Staging		13	5	10					
Prizes		4	15	0					
				18	0	10			
<b>PUBLIC ANNOUNCEMENTS:—</b>									
Advertising		224	15	8	182	14	3		
Billposting		309	19	3	141	17	5		
Railway Placards		70	17	0	62	15	0		
Printing		99	19	11	40	11	0		
				705	11	10	427	17	8
Carried forward	£	14,141	11	6					

Dr.

CASH ACCOUNT—*continued.*

RECEIPTS.	1920 SALISBURY			1915 WORCESTER.		
	£	s	d	£	s	d
Brought forward				15,537	0	4
SHOW (UNAPPORTIONABLE) —						
Sales, Fittings, etc	306	16	8		274	1 7
Contract Premiums	365	0	0		319	3 3
Cloak Room and Lavatories	100	18	11			
Guildford Local Committee Balance	19	15	2			
				882	10	9
					593	4 10
SUBSCRIPTIONS FROM TOWNS —						
Bristol for 1921 Show				800	0	0
					400	0 0
				17,219	11	1
					8,228	11 11
Deposit returned					1,500	0 0
Balance in Bank January 1				56	17	9
„ due to Bank, December 31				1,739	14	1
					16	16 4
	£19,016	2	11	£9,743	8	3



**CASH ACCOUNT—continued.****CR**

PAYMENTS	1920 SALISBURY						1917 WORCESTER		
	£	s	d	£	s	d	£	s	d
Brought forward				14,141	11	6			
SHOW (Unapportionable)									
Official Buildings etc	3	0	8	14	3		1	0	8
Hoarding	1	4	6	3			28	8	9
Carriage of Plant	1	9	2	8					
Stand Fittings	2	3	4	10	0		13	9	0
Insurance	4	1	0				22	0	4
Furnishing Official Buildings	17	7	6				2	3	6
Mess Room Allotment Expenses etc	11	4	6				10	7	1
Gatekeepers Yardmen, Messengers etc	16	3	9	4			94	16	0
Stewards of Finance and Treasurer	26	11	0				14	13	4
Secretaries and Finance Office and Treasurers									
Clerks	78	6	11				47	9	4
Police	40	16	1				127	19	5
Badges etc	3	1	0				3	8	10
Catalogues for Press and Officials	11	10	6				0	8	6
Purchase of Plant	96	7	9				9	17	11
Printing Stationery etc	49	1	11				36	16	0
Extension of Telegraph Wires and Telephone	0	11	4				2	0	0
Works Assistant							0	14	6
				1740	11	0	1676	9	7
EXPERIMENTS —									
Cider Institute				100	0	0	100	0	0
				18,382	2	11	9,684	12	10
Investments				34	0	0			
Balance due to Bank January 1st							0	1	0
				£19,016	2	11	9,684	8	9

JANUARY 17TH 1921

I hereby certify that I have examined the foregoing accounts for the year ending December 31st, 1920, compared the payments entered with the vouchers, and found them all in order and correct

F CLIFFORD GOODMAN F C A

Auditor

Passed by Council,

January 25th, 1921.

F H STORR. Secretary



[illegible]

**Bath and West and Southern Counties Society,**  
**FOR THE**  
*Encouragement of Agriculture, Arts, Manufactures and Commerce.*

## List of Members, 1921.

### PATRON.

HIS MOST GRACIOUS MAJESTY THE KING.

### PRESIDENT.

THE RIGHT HON. THE LORD BLEDISLOE. K.B.E.

### TRUSTEES.

THE MOST HON. THE MARQUIS OF BATH, K.G.

C. L. F. EDWARDS, Esq.

SIR. J. SHELLEY, BART.

*Names thus (\*) distinguished are Governors.*

*Names thus (†) distinguished are Life Members.*

\* \* *Members are particularly requested to make the Secretary acquainted with any errors in the names or residences.*

Name.	Residence.	Sub- scriptions.
		£ s. d.
*†His Most Gracious Majesty the King . . . . .	Windsor Castle . . . . .	..
Ackers, Major Chas. P. . . . .	Huntley Manor, Gloucester . . . . .	1 0 0
Ackland, J. . . . .	Francis Court, Broadclyst, Exeter . . . . .	1 0 0
Acland, Alfred Dyke . . . . .	. . . . .	1 0 0
†Acland, Right Hon. Sir Arthur H. Dyke . . . . .	85, Onslow Square, London, S.W.7 . . . . .	..
Acland, Right Hon. F. Dyke, M.P. . . . .	93, Bedford Gardens, Campden Hill, London, W. . . . .	1 0 0
Adams, E. C. . . . .	Brentwood, Combe Down, Bath . . . . .	1 0 0
Adlam, J. C. . . . .	Manor Farm, East Horrington, Wells . . . . .	1 0 0
Akers, E. . . . .	St. Fagans, Cardiff . . . . .	1 0 0
Alexander, D. . . . .	Cardiff . . . . .	1 1 0
Alexander, H. G. . . . .	Dinas Powis, Cardiff . . . . .	1 1 0
Allen, A. . . . .	Chesterblade, Shepton Mallet . . . . .	1 1 0

<b>Name.</b>	<b>Residence.</b>	<b>Sub- scriptions.</b>
Allen & Foster . . . .		
Allen & Sons . . . .	Cheese Merchants, Shepton Mallet	1 1 0
†Allen, Miss Ida . . . .	Springfield House, Shepton Mallet . . . . .	..
Allen, W. T. . . . .	Bradley House, West Pennard, Bridgwater . . . . .	1 0 0
Allott, Major P. B. . . .	Little Ashton, Codford, Wilts	1 0 0
Allsebrook, A. . . . .	Link Elm, Malvern Link . . . .	1 1 0
Ames, F. . . . .	Hawford Lodge, Worcester . . . .	1 0 0
Andrews, S. Fox- Anglo-Continental Guano Works . . . . .	Union Street, Bath . . . . .	1 0 0
Anglo-Swiss Condensed Milk Company . . . . .	Dock House, Billiter Street, E.C.3.	1 0 0
*Ansdell, C. W. . . . .	Chippenham . . . . .	1 0 0
	Leckford Abbas, Stockbridge, Hants . . . . .	2 0 0
Armitage, F. . . . .	Dean Court, Taunton . . . . .	1 1 0
Arnott, G. C. (Fertilisers Manufacturers Association)	69, Fenchurch Street, London, E.C.3 . . . . .	1 0 0
†Ashcomb, Lord . . . .	Denbies, Dorking . . . . .	..
†Ashcroft, W. . . . .	13, The Waldrons, Croydon . . . .	..
Ashford, E. C., M.D. . . .	The Moorlands, Bath . . . . .	1 0 0
*Astor, Hon. Waldorf . . .	Cliveden, Taplow, Bucks . . . .	2 0 0
Angerstein, J. R. . . . .	Holbrook House, Wincanton . . . .	1 0 0
Austin, E. A. . . . .	Baltonsborough, Glastonbury . . .	1 1 0
†Avebury, Lord . . . .	High Elms, Hayes, Kent . . . . .	..
†Aveling, Thomas L. . . .	Rochester . . . . .	..
Avon Manure Company (Ld.)	St. Philip's Marsh, Bristol . . . .	1 0 0
Badcock, H. Jefferies . . .	Broadlands, Taunton . . . . .	1 0 0
Badcock, S. H. . . . .	Holmwood, Westbury-on-Trym, Bristol . . . . .	1 0 0
Bainbridge, Mrs. R. C. . . .	Elfordleigh, Plympton, South Devon	1 0 0
Baker, G. E., J.P. . . . .	The Old House, Freshford, Bath . .	1 1 0
Baker, G. E. Lloyd . . . .	Hardwicke Court, Gloucester . . .	1 0 0
†Baker, M. G. Lloyd . . . .	The Cottage, Hardwicke, Glos. . .	..
†Baker, L. J. . . . .	Brambridge Park, Eastleigh, Hants . . . . .	..
Bamfords (Ltd.) . . . . .	Uttoxeter . . . . .	1 0 0
Barford and Perkins (Ltd.),	Peterborough . . . . .	1 0 0
Barham, G. T. . . . .	Sudbury Park, Wembley, Middlesex	1 0 0
Baring, Hon. A. H. . . . .	The Grange, Alresford, Hants . . .	1 0 0
*Barker-Hahlo, H. . . . .	Camerton Court, Bath . . . . .	2 0 0
Barrett, Col. W. . . . .	Hill House, Minehead . . . . .	1 0 0
Barstow, J. J. J. . . . .	The Lodge, Weston-super-Mare . . .	1 1 0

Name.	Residence.	Subscriptions.		
		£	s.	d.
Barton, D. J. . . . .	Bodrean, Truro, Cornwall . . . .	0	10	0
Barton, W. L. . . . .	Easton House, Corsham . . . .	1	0	0
Bassett, A. F. . . . .	Tehidy, Camborne, Cornwall . . .	1	0	0
Bastard, H. E. . . . .	Tinten Manor, St. Tudy, S.O., Cornwall . . . . .	1	0	0
Bates & Scholes . . . .	Victoria Iron Works, Denton, Man- chester . . . . .	1	0	0
Bath, Major R. . . . .	Glastonbury . . . . .	1	0	0
*†Bath, Marquis of, K.G. . .	Longleat, Warminster . . . .	..		
Bath and Somersetshire Dairy Co. (Ltd.) . . . .	Bath . . . . .	1	0	0
Bath and Wells, The Bishop of . . . . .	The Palace, Wells . . . . .	1	1	0
Bath Brewery Co. (Ltd.) . .	Argyle Street, Bath . . . . .	1	0	0
Bath Gas Company . . . .	Bath . . . . .	1	0	0
Bathurst, F. Marlay . . . .	The Warren, Lydney, Gloucester- shire . . . . .	1	0	0
Bathurst, Hon. B. L. . . .	Lydney Park, Gloucestershire . .	1	1	0
Bathurst, Major Sir F. Hervey, Bart., D.S.O. . .	Somborne Park, Stockbridge, Hants . . . . .	1	1	0
Batt, R. . . . .	Clapton, Ston Easton, Bath . . .	1	0	0
*Batten, Major H. C., D.S.O.	Aldon, Yeovil . . . . .	2	0	0
Batten, Col. Cary . . . .	Abbotsleigh, Bristol . . . . .	1	0	0
Batten-Pooll, R. H. . . .	Road Manor, Bath . . . . .	1	0	0
†Baxendale, J. Noel . . . .	Froxfield Green, Petersfield . .	..		
Beauchamp, E. B. . . . .	Trevince, Redruth . . . . .	1	0	0
Beauchamp, Sir F. B. . . .	Woodborough House, Peasodown St. John, Bath . . . . .	1	1	0
*Beaufort, Duke of . . . .	Badminton, Chippenham . . . .	2	2	0
Beaufoy, M. H. . . . .	Coombe Priory, Shaftesbury . .	1	0	0
Bell, Lieut.-Colonel M. G. E	Bourne Park, near Canterbury .	1	0	0
Benett-Stanford, Capt. J. . .	Hatch House, Tisbury . . . .	1	0	0
Bennett, Brothers . . . .	Journal Office, Salisbury . . . .	1	1	0
Bennett, R. A. . . . .	Thornbury, Glos. . . . .	1	0	0
Bentall, Edward H. & Co. .	Heybridge, Maldon, Essex . . .	1	0	0
Bentley, A. F. . . . .	Woodlands House, Woodlands, Southampton . . . . .	1	0	0
Benyon, H. A. . . . .	Englefield House, Reading . . .	1	1	0
*Benyon, J. Herbert . . . .	Englefield House, Reading . . .	5	0	0
Berry, A. E. . . . .	Rowgardens Wood, Charlwood, Surrey . . . . .	1	0	0
Berryman, F. H. . . . .	Field House, Shepton Mallet . .	1	1	0
Bessant, W. . . . .	Skinner's Farm, Woolland, Bland- ford, Dorset . . . . .	1	0	0
Best, Major T. G. . . . .	East Carleton Manor, Norwich . .	1	0	0
†Best, Capt. W. . . . .	Vivod, Llangollen, North Wales .	..		
Best, Hon. J. W. . . . .	Charlton House, Ludwell, Salis- bury . . . . .	1	0	0
Beynon, J. W. . . . .	16, Mount Stuart Square, Cardiff .	1	1	0

Name.	Residence.	Subscriptions.		
		£	s.	d.
Biddle, W. F. . . . .	Parsonage Lane, Butleigh, Glas- tonbury . . . . .	1	0	0
Birmingham, C. . . . .	Nutscale, The Parks, Minehead . .	0	10	0
Bishop, B. G. . . . .	Roddimore, Winslow, Bucks . . .	1	1	0
†Blackburn, H. P. . . . .	Donhead Hall, Salisbury . . . . .	..		
†Blackstone, G. M. . . . .	Blackstone & Co., Ltd., Stamford .	..		
Blake, Col. M. Lock . . . . .	Bridge, S. Petherton . . . . .	1	0	0
Blandy, Capt. S. H. B. . . . .	Ivythorn Manor, Street, Somerset .	1	0	0
Blathwayt, Rev. W. E. . . . .	Dyrham Rectory, Chippenham . . .	1	0	0
Blathwayt, R. W. . . . .	Dyrham Park, Chippenham . . . . .	1	1	0
†Bledisloe, Lord, K.B.E. . . . .	Lydney Park, Gloucester . . . . .	..		
Bledisloe, Lady . . . . .	Lydney Park, Gloucester . . . . .	1	0	0
Blinman, F. R. . . . .	Auctioneer, Farington Gurney, Bristol . . . . .	1	0	0
Blinman H. T. . . . .	Auctioneer, Farington Gurney, Bristol . . . . .	1	0	0
Bolitho, R. F. . . . .	Ponsandane, Penzance . . . . .	1	1	0
Bolitho, T. R. . . . .	Trengwainton, Hea Moor, Cornwall .	1	1	0
Bond E. (W. Evans & Co.). . . . .	Hele, Cullompton . . . . .	1	0	0
Boscawen, Rev. A. T. . . . .	Ludgvan Rectory, Long Rock, R.S.O., Cornwall . . . . .	1	0	0
Boscawen, Townshend E. . . . .	2, Old Burlington St., London, W.1 .	1	0	0
Bouverie, H. P. . . . .	Brymore, Bridgwater . . . . .	1	0	0
†Bowen-Jones, Sir J., Bart. . . . .	The Woodlands, Bicton, near Shrewsbury . . . . .	..		
†Bowerman, Alfred . . . . .	Sydney Villa, Broadclyst, Exeter . .	..		
Braby, F. & Co., (Ltd.) . . . . .	Ashton Gate Works, Bristol . . . .	1	0	0
Bradford, Thomas & Co. . . . .	Salford, Manchester . . . . .	1	0	0
*Braithwaite, T. S. . . . .	Durley Hill, Keynsham, Somerset .	2	0	0
*†Brassey, H. L. C. . . . .	Apethorpe Hall, Wansford, Northants . . . . .	..		
†Brassey, (Capt. R. B. . . . .	Heythrop, Chipping Norton, Oxon . .	..		
Brenton, W. (Ltd.), . . . . .	St. Germans, Cornwall . . . . .	1	0	0
*Bridges, Agricultural Engineers . . . . .	Whiteway Works, Cirencester . . . .	2	0	0
Bridges, J. H. . . . .	Ewell Court, near Epsom . . . . .	1	1	0
Bridgman, H. . . . .	Cleve Hill Farm, Downend, Bristol .	1	1	0
†Brinkley, Rev. W. F. D. . . . .	The Vicarage, Abbots Leigh, Bristol . . . . .	..		
<i>Bristol Times and Mirror</i> , . . . . .				
Proprietors of . . . . .	Bristol . . . . .	1	0	0
Bristol Wagon & Carriage Works Co., (Ltd.) . . . . .	Bristol . . . . .	1	1	0
Britten, Forester . . . . .	Kenswick Manor, Worcester . . . .	1	0	0
†Brocklehurst, H. D. . . . .	Sudeley Castle, Winchcombe . . . .	..		
Brockman, F. D. . . . .		1	0	0
Broughton, B. R. . . . .	Manor Farm, North Perrott, Crewkerne . . . . .	1	0	0
Brown, F. E. . . . .	1,403, Neath Road, Swansea . . . .	1	0	0

Name.	Residence.	Subscriptions.		
		£	s.	d.
Brown, T., and Son . . . .	Marham Hall, near Downham, Norfolk . . . . .	1	0	0
Browning, Albert . . . .	The Homestead, Combe Park, Bath . . . . .	1	1	0
Bruford R. . . . .	Nerrols, Taunton . . . . .	1	0	0
Buchanan, G. . . . .	Manor House Farm, Abergavenny . . . . .	1	0	0
Buck. D. . . . .	White House, Little Mill, Ponty- pool . . . . .	1	0	0
Buckingham, Rev. C. L. . .	Rotherfield, Sussex . . . . .	1	1	0
†Buckingham, Rev. Preb. .	The Rectory, Doddiscombsleigh, Exeter, Devon . . . . .	..	..	..
Buckingham, Capt. F. R. .	Doddiscombsleigh, Exeter . . . . .	1	1	0
Budd, Felix S. . . . .	Clarendon House, Stow Park, New port, Mon. . . . .	1	0	0
Budd, J. E. . . . .	Tidebrook Manor, Wadhurst, Sussex . . . . .	1	0	0
Burghclere, Lord . . . .	48, Charles Street, London, W. . . . .	1	0	0
Burnard & Algar . . . .	Plymouth . . . . .	1	0	0
Burrell, C. and Sons . . .	St. Nicholas Works, Thetford . . . . .	1	0	0
*Burrell, Sir M. R., Bart. .	Knepp Castle, Horsham, Sussex . . . . .	2	0	0
†Bush, H. G. . . . .	The Grove, Alveston, Glos. . . . .	..	..	..
Bush, Mrs. L. E. . . . .	St. Mary's, Atlantic Road South, Weston-s-Mare . . . . .	1	1	0
Busk, W. G. . . . .	Wraxall Manor, Cattistock, Dorset . . . . .	1	0	0
*Bute, The Marquis of . .	The Castle, Cardiff . . . . .	2	0	0
Butler, W. . . . .	Catcombe Farm, Long Ashton, Bristol . . . . .	1	0	0
Cable, Lord . . . . .	Lindridge, near Teignmouth . . . . .	1	1	0
Cæsar, H. and J. . . . .	Knutsford, Cheshire . . . . .	1	0	0
Campbell, J. . . . .	31, St. Albans Road, Swansea . . . . .	1	0	0
Candy, T. C. . . . .	Woolcombe, Cattistock, Dorset . . . . .	1	0	0
Candy, W. T. . . . .	Beryl Farm, Wells . . . . .	1	0	0
Candy, H. J. . . . .	Upper Lodge Farm, Ston Easton, Bath . . . . .	1	0	0
Carew, C., M.P.. . . . .	Collipriest, Tiverton . . . . .	1	0	0
Carnarvon, Earl of . . . .	Highclere Castle, Newbury . . . . .	1	1	0
*Carr, Jonathan . . . . .	Wood House, Twerton-on-Avon, Bath . . . . .	2	2	0
†Carruthers W., F.R.S. . .	14, Vermont Road, Norwood, London, S.E. . . . .	..	..	..
Carson, J. . . . .	Crystalbrook, Theydon Bois, Essex . . . . .	1	1	0
Carter, A. H. . . . .	Albion Chambers, Bristol . . . . .	1	0	0
†Carter, E. . . . .	East Upton, Ryde, Isle of Wight . . . . .	..	..	..
Carter, G. V. . . . .	Waterston Manor, Dorchester . . . . .	1	1	0
Carter, Dunnett & Beale, J. .	Raynes Park, London, S.W. . . . .	1	0	0



Name.	Residence.	Subscriptions.		
		£	s.	d.
Cartwright, T. G.	30, Beaufort Gardens, London, S.W.	1	0	0
Cary, Edmund	Pylle, Shepton Mallet	0	10	0
†Cary, John	The Priory, Shepton Mallet	..		
†Cary, W. H.	Clifton Club, Clifton, Bristol	..		
Cattybrook Brick Co. (Ltd.)	Provident Buildings, 15, Clare Street, Bristol	1	0	0
Cave, Captain A. L.	Sherwood, Newton St. Cyres, Exeter	1	0	0
Cave, Sir C., Bart.	Lidbury Manor, Sidmouth	1	0	0
Cave, C. H.	Rodway Hill House, Mangotsfield, Bristol	1	0	0
Cazalet, W. M.	Fairlawne, Tonbridge	1	0	0
Chamberlain, T. A.	The Batch, Flax Bourton, Bristol	1	0	0
Chandler, R.	Charity Farm, Longstock, Hants.	1	0	0
Chapman, W. W.	Mowbray House, Norfolk Street, Strand, London, W.C.2	1	1	0
Chichester, Major C. H.	Hall, Bishops Tawton, Barnstaple	1	0	0
†Chick, J. H.	Wynford Eagle, Maiden Newton, Dorset	..		
†Chick, W. D.	Compton Valence, Dorchester	..		
Chivers and Son	Histon, Cambridge	1	0	0
Christie, A. L.	Tapeley Park, Instow, N. Devon	1	1	0
Christie-Miller, S. R.	Clarendon Park, Salisbury	1	0	0
Churchill, The Viscount, G.C.V.O.	Carlton Club, Pall Mall, London, S.W.1.	1	0	0
†Churchward, F.	Hill House, Stoke Gabriel, near Totnes	..		
Clare, A. J.	Beach Hill, Wells	1	0	0
*Clarendon, Earl of	The Grove, Watford	2	2	0
†Clark, C. S.	Tracy Park, Near Bath	..		
Clark, H.	North Wootton, Shepton Mallet	1	0	0
Clark, H. B.	Butleigh, Glastonbury	1	0	0
Clark, H. A.	Hinton Field, Hinton Charterhouse, Bath	1	0	0
†Clark, J. J.	Goldstone Farm, Hove, Sussex (Hon. Local Sec., 1885)	..		
Clark, W. S.	Street, Glastonbury	1	0	0
Clark, W. H.	Rutland Cottage, Combe Down, Bath	1	1	0
Clarke, J. B.	Overleigh House, Street, Somerset	1	0	0
Clerk, Lieut.-Col. R. M.	Charlton House, Shepton Mallet	1	0	0
*Clifden, Viscount	Lanhydroc, Bodmin	2	0	0
Clinton, Lord	Heanton Satchville, Dolton, N. Devon	1	0	0
Clutton, R. W.	Hartswood, Reigate	1	0	0
Coaker, J.	Blagdon Barton, Paignton, Devon	0	10	0
Cobb, H. M.	Higham, Rochester	1	0	0
Cobb, R.	Larkin Hall, near Rochester	1	0	0
Coleridge, Hon. G.	Toddington, Winchcombe	1	0	0
Collet, Sir Mark, Bart.	St. Clare, Kemsing, Sevenoaks	1	1	0

Name.	Residence.	Subscriptions.		
		£	s.	d.
Collins, A. H. . . .	Manor Farm, Codford St. Peter, Wilts . . . .	1	0	0
Collins, J. J. S. . .	St. George's Lodge, Oldfield Park Bath . . . .	1	1	0
Colman, Sir J., Bart.	Gatton Park, Surrey . . . .	1	0	0
Colmer, Jas. (Ltd.) .	Union Street, Bath . . . .	1	0	0
Colville, H. K. . . .	Hillmarton Lodge, Calne, Wilts . . . .	1	0	0
Combes, D. Jn., C. C.	Manor Farm, Dinton, Salisbury . . . .	1	1	0
Cook, R. . . . .	Widhayes, Tiverton . . . .	1	0	0
†Cookson, H. T. . .	Sturford Mead, Warminster . . . .	..		
Cookson, Mrs. Freville	Chute Standen, Andover . . . .	1	0	0
Cookson, Miss W. .	Chute Standen, Andover . . . .	1	0	0
Cooling, G. and Sons	Northgate Street, Bath . . . .	1	1	0
Cooper, Major R. W.	Eling House, Hermitage, Berks . . . .	1	0	0
Cooper, Sir G., Bart.	Hursley Park, Winchester . . . .	1	0	0
Coote, Lady Eyre .	West Park, Damerham, Salisbury . . . .	1	0	0
Cope, W. . . . .	Southerndown, Glam. . . .	1	1	0
Corbet, E. W. M. . .	Bute Estate Office, Cardiff . . . .	1	1	0
Corbett, S. E. . . .	Perseverance Iron Works, Shrewsbury . . . .	1	0	0
†Cork and Orrery, The Earl of	. . . . .	..		
†Corner, H. W. . . .	Manor House, Inglescombe, Bath. . . .	..		
Cornish, Dr. . . . .	Pixford, Taunton . . . .	1	0	0
†Cornwallis, F. S. W.	Linton Park, Maidstone . . . .	..		
Corp R. . . . .	Wordford Farm, Wells . . . .	1	0	0
Cory, Sir Clifford, J., Bart.	. . . . .	..		
M.P., D.L. . . . .	Llantarnam Abbey, Mon. . . .	1	0	0
†Cotterell, Sir J. R. G., Bart	Garnons, Hereford . . . .	..		
Cotton, R. W. . . .	Baltonsborough, Glastonbury . . . .	1	0	0
Coulas, J. R. . . .	Allington, near Grantham . . . .	1	0	0
Coultrip, A. W. . .	Norwood Manor, East Church, Kent . . . .	1	0	0
†Courage, Raymond .	Shenfield Place, Brentwood, Essex . . . .	..		
†Coussmaker, Lt.-Col. G.	Westwood, Normandy, Guildford, Surrey . . . .	..		
*Coventry, The Earl of	Croome Court, Worcester . . . .	2	0	0
Cox, B. . . . .	Pwlpfen Farm, Christchurch, Newport, Mon. . . .	0	10	0
Cox & Sons . . . .	47, City Road, Cardiff . . . .	1	0	0
Crick, Thomas . . .	Alcombe, Cross Road, Minehead . . . .	0	10	0
Cridlan, J. J. . . .	Maisemore Park, Gloucester . . . .	1	0	0
Croad and Brown . .	Branch of British Oil & Cake Mills, Bridgwater . . . .	1	1	0
Cross, F. R. . . . .	Worcester House, Clifton . . . .	1	0	0
*Cross, Carlton . .	Wyke Hall, Gillingham . . . .	2	0	0
Crossman, A. . . .	Ivythorn, Street, Somerset . . . .	1	0	0
Crossman D. . . . .	Lower Farm, West Horrington, Wells . . . .	1	0	0

Name.	Residence.	Subscriptions.		
		£	s.	d.
Crowdy, A. A. G.	Manor Farm, East Horrington, Wells	1	0	0
Crutchley, P. E.	Limminghill Lodge, Ascom	1	0	0
Cumber, W. J.	Theale, Berks	1	0	0
Cuming, A. P.	Moreton Hampstead, Devon	1	0	0
Cundall, H. M., I.S.O., F.S.A.	4, Marchmont Gardens, Richmond Hill, Surrey	1	0	0
†Currie E.	Itton Court, Chepstow	..		
Currie, L.	Minley Manor, Farnborough, Hants	1	0	0
Dairy Supply Company (Ltd.)	Museum St., Bloomsbury, London, W.C.9	1	0	0
Dale, T. F.	Brush End, Burley, Hants.	1	0	0
†Daniel, H. T.	The Red House, Cannington, Bridgewater	..		
Daniel, Thos. C.	Stuckeridge, Bampton, North Devon	1	1	0
Darby, A. E. W.	Little Ness, Shrewsbury	1	0	0
Darby, E.	Liscombe, Dulverton	1	0	0
†Darell, D.	Hillfield House, Stoke Fleming, near Dartmouth	..		
†Davey, J. Sydney	Brockym, Cury-Cross-Lanes, Cornwall	..		
Davey, Sleep & Co. (Ltd.)	Excelsior Plough Works, Plymouth	1	0	0
†Davey, T. R.	Wraxall Court, Near Bristol	..		
David & David	Old Bank Chambers, 27, High Street, Cardiff	1	0	0
Davies, D.	The Borough Stores, College Street, Swansea	1	1	0
†Davis, H. J.	Sutton Montis, Sparkford, S.O., Somerset	..		
Davis & Co.	75, George Street, Oxford	1	0	0
Daw, J. E.	4, Louisa Terrace, Exmouth	1	1	0
Day & Sons (Ltd.)	Crewe	1	0	0
†Deacon, W. S.	Poynters, Cobham, Surrey	..		
*†Debenham E. R.	Morton House, Near Dorchester	..		
Debenham, H.	Buckland House, Buckland St. Mary, Taunton	1	0	0
De Bertodano, B.	Cowbridge House, Malmesbury	1	0	0
De Hamel, E.	Middleton Hall, Tamworth	1	0	0
Demuth, R. H.	..	1	0	0
Denning, C. & Co.	Chard, Somerset	1	0	0
Dennis, S.	Latton, Cricklade, Wilts	1	0	0
†Devas, H. G.	"Nizels," Hildenborough, Tonbridge	..		
Devenish, H. N.	Little Dunford, Salisbury	1	0	0
*Devon, The Earl of.	Powderham Castle, Devon	2	0	0

Name.	Residence.	Subscriptions.		
		£	s.	d.
*Devonshire, Duke of . . .	Chatsworth, Derbyshire . . .	5	0	0
Dickinson, W. F. . . .	Kingweston, Somerton . . .	1	0	0
Dickinson, Major S. C. . .	Orchard House, West Coker, Yeovil . . . . .	1	0	0
Dickson & Robinson . . .	Cathedral Street, Manchester . .	1	1	0
*Digby, Capt., The Lord, D.S.O., M.C. (Coldstream Guards) . . . . .	Rush House, Farnborough Park, Hants . . . . .	2	0	0
Digby, F. J. B. Wingfield . .	Sherborne . . . . .	1	0	0
†Dobson, H. V. . . . .	Bath & County Club, Bath . . .	..		
Dodington, R. M. . . . .	Horsington Park, Templecombe .	1	1	0
Dormer, Capt. C. W. C. . .	Rousham, Oxford . . . . .	1	0	0
Dors, J. C. . . . .	Hunters Lodge, Wells . . . . .	1	0	0
Down, H. E. . . . .	Middle Farm, Dinder, Wells . .	1	0	0
Drummond, Col. F. D. W., C.B.E. . . . .	Cawdor Estate Office, Carmarthen	1	0	0
Drummond, H. W. . . . .	Board Room, L. & S.W.R., Water- loo Station, London . . . . .	1	0	0
Dubourg, Lt.-Col. S. . . .	The Mount, Wilton, Salisbury . .	1	0	0
Duchesne, M. C. . . . .	Farnham Common, Slough, Bucks	1	0	0
*Ducie, Earl of. . . . .	Tortworth Court, Falfield, R.S.O., Glos. . . . .	2	0	0
Duck, W. . . . .	Neadwood, Christon, near Exeter	1	1	0
Dugdale, Major J. G. . . .	The Abbey, Cirencester . . . .	1	0	0
Duncan, R. . . . .	Rhooose, near Barry . . . . .	1	0	0
Dunlop, I. M. . . . .	Avonhurst, Sneyd Park, Bristol .	1	0	0
Eagle Range and Gas Stove Company (Ltd.) . . . .	Catherine St., Aston, Birmingham	1	0	0
Eastwood, A. C. . . . .	Leigh Court, Taunton . . . .	1	0	0
*†Eastwood, J. E. . . . .	Wade Court, Havant . . . . .	..		
Economic Fencing Company (Ltd.) . . . . .	Billiter House, Billiter Street, London, E.C.3 . . . . .	1	0	0
Eden, R. H. H. . . . .	Sherborne, Dorset . . . . .	1	1	0
†Edgcumbe, Sir Robert Pearce . . . . .	..	..		
*Edge, S. F. . . . .	Gallops Homestead, Ditchling, Sussex . . . . .	2	2	0
†Edmondson, A. . . . .	Woodclose, Silverdale, Lancashire	..		
Edmunds, L. . . . .	Cholderton, Salisbury . . . .	1	0	0
Edwards, A. P. . . . .	Gog's House, Wedmore, Somerset	1	1	0
Edwards, C. L. Fry . . . .	The Court, Axbridge, Somerset .	1	0	0
Edwards, R. G. . . . .	Burrington Vicarage, Bristol . .	1	1	0
Edwards, W. H. G. . . .	Butcombe Court, Wrington . .	1	0	0

Name.	Residence.	Subscriptions.		
		£	s.	d.
*Edwards-Ker, D. R.	Principal, Seale Hayne Agricultural College, Newton Abbot	2	0	0
Eldridge, Pope & Co.	Dorchester	1	0	0
Elliott, T. M.	Biddestone, Chippenham	1	0	0
Elton, B. A.	Clevedon Court, Somerset	1	0	0
Elwes, Lt.-Col. H. C., D.S.O., M.V.O.	Colesbourn, Cheltenham	1	1	0
Elwes, P.	Somerton, Somerset	1	0	0
Ensor, T. & Sons	Auctioneers, Dorchester	1	0	0
Errington, R.	Victoria Mills, Sunderland	1	0	0
Esdaile, C. E. T.	Cothelstone House, Taunton	1	0	0
Evans, H. M. Glynn.	Plasissa, Llangennech, Carmarthenshire	1	0	0
Evans, E. W.	Crickleaze House, Chard	1	1	0
Evans, Thomas	Berkeley Villa, St. James's Garden, Swansea	1	0	0
†Evan-Thomas, Commander A.	Caerwnnon, Builth Wells, R.S.O.	..		
†Eve, Mr. Justice	Royal Courts of Justice, London, W.C.2	..		
Evelyn, Mrs.	Wotton House, near Dorking	1	0	0
Eyles, T. W.	Ashley Wood, Kingsdown, Box, Wilts	1	1	0
Ezra, E.	Lock, Partridge Green, Sussex	1	0	0
*†Falmouth, Viscount	Tregothnan, Truro	..		
Fane, Captain H. N.	Boyton Manor, Codford, Wilts	1	0	0
Faringdon, Lord	Buscot Park, Faringdon	1	1	0
†Farmer, S. W.	Little Bedwyn, Wilts	..		
Farwell, Major E. W.	Hylton Estate Office, Kilmersdon, Bath	..		
Fastnut (Ltd.)	Beehive Wharf, Brentford, Middlesex	1	1	0
Faudel-Phillips, Major H.	Stoney Ware, Marlow	1	0	0
Feaver, A.	Coal, Cake and Corn Merchant, Evercreech	1	0	0
Fenton, A. D.	Maristow, Roborough, S. Devon	0	10	0
Ferrand, G. F.	Morland Hall, Alton, Hants	1	0	0
Fewtrell, O. J.	Estate Office, Wells	1	0	0
Finlay, Col. Alexander	Little Brickhill, Bletchley, Bucks	1	0	0
Finn, L. & G. W.	Westwood Court, Faversham, Kent	1	0	0
*Fitzgerald, Lady	Buckland, Faringdon, Berks	2	0	0
Fleming, J. Willis	Stoneham Park, Eastleigh, Hants.	1	0	0
Flower, James	Chilmark, Salisbury	1	0	0
*†Folkestone, Viscount	Longford Castle, Salisbury	..		
*†Forester, Capt. F. W.	Saxilbye Park, Melton Mowbray	..		
Forrest, Col. W.	St. Fagan's, Cardiff	1	0	0

Name.	Residence.	Subscriptions.		
		£	s.	d.
Forster, J. C. . . . .	Clatford Mills, Andover . . . . .	1	0	0
Fortune, R. . . . .	Newhouse, Cranleigh, Surrey . . . . .	1	0	0
†Fortescue, J. B. . . . .	Broconnoc, Lostwithiel, Cornwall . . . . .	..		
Four Oaks Spraying Machine Co. (Ltd.) . . . . .	Four Oaks Works, Sutton Coldfield . . . . .	1	0	0
Fowler & de la Perrelle . . . . .	Porter's Lane, Southampton . . . . .	1	0	0
Fowler, J. & Co. (Ltd.) . . . . .	Leeds . . . . .	1	0	0
Fox, Brothers & Co. . . . .	Wellington, Somerset . . . . .	1	1	0
Fox, C. L. . . . .	Rumwell Hall, Taunton . . . . .	1	0	0
Fox, Mrs. A. . . . .	Brislington House, near Bristol . . . . .	1	0	0
†Fox, Robert . . . . .	Grove Hill, Falmouth . . . . .	..		
Fox, R. A. . . . .	Yate House, Yate, Glos. . . . .	1	1	0
Foxcroft, C. T., M.P. . . . .	Hinton Charterhouse, Bath . . . . .	1	1	0
Francis, Major O. L. . . . .	Downton, Salisbury . . . . .	1	1	0
Freeman, T. & Sons . . . . .	Monkton Combe Mills, Bath . . . . .	1	1	0
*Fremlin, W. T. . . . .	Milgate Park, Maidstone . . . . .	2	0	0
Frost, W. . . . .	The Red House, Almondsbury, Glos. . . . .	1	0	0
Fry, A. M. . . . .	8, Zion Hill, Clifton, Bristol . . . . .	1	1	0
Fry, C. A. H. . . . .	Ashton Lodge, Long Ashton . . . . .	1	0	0
*Fry, J. S. & Son (Ltd.) . . . . .	Union Street, Bristol . . . . .	2	2	0
†Fuller, G. Pargiter . . . . .	Neston Park, Corsham . . . . .	..		
*Fuller, Major R. F. . . . .	Great Chalfield, Melksham . . . . .	2	0	0
Fuller, S. & A. . . . .	Bath . . . . .	1	0	0
Fursdon, E. S. . . . .	Hevers, Mont le Grand, Heavitree, Exeter . . . . .	1	1	0
Galloway, J. . . . .	Sharcombe Park, Dinder, Wells, Somerset . . . . .	1	1	0
Gane, R. J. . . . .	Higher Roche Farm, Butleigh, Glastonbury . . . . .	1	0	0
Gardiner, Sons & Co. . . . .	Nelson Street, Bristol . . . . .	1	1	0
Garne, W. . . . .	Aldsworth, Northleach . . . . .	1	1	0
Garne, W. T. . . . .	Aldsworth, Northleach . . . . .	1	1	0
Garrett, W. . . . .	Backwell Hill House, West Town, R.S.O., Somerset . . . . .	1	0	0
Garton, Jas. . . . .	Clarendon Park, Salisbury . . . . .	1	0	0
Gazzard, M. H. . . . .	Sanager Farm, Sharpness, Berkeley . . . . .	1	0	0
Genge, M. . . . .	Stop Farm, Fonthill Gifford, Tisbury . . . . .	1	1	0
*†George, William E., J.P. . . . .	Downside, Stoke Bishop, Bristol . . . . .	..		
Gibbins, T. . . . .	Glynfelin, Neath . . . . .	1	1	0
†Gibbons, H. . . . .	Church Farm, Clutton, Bristol . . . . .	..		
Gibbons, P. F., J.P. . . . .	Keynsham . . . . .	1	1	0
Gibbs, A. H. . . . .	Pytte, Clyst St. George, Exeter . . . . .	1	0	0
*†Gibbs, Lt.-Col. G. A., M.P. . . . .	Tyntesfield, Bristol . . . . .	..		
Gibbs, G. M. . . . .	Gratwicke Hall, Flax Bourton . . . . .	1	0	0

Name.	Residence.	Subscriptions.		
		£	s.	d.
Gibbs, Lt.-Col. W. O.	Chippenham	1	1	0
†Gibbs, H. M.	Barrow Court, Flax Bourton, Bristol	..	..	..
Gibson, J. T.	Warren House, Wrington	1	1	0
Gifford, G.	Lyde Green, Pucklechurch, Bristol	1	1	0
Gillingham, J. & Son	Prospect House, Chard	1	0	0
†Gladstone, J.	Bowden Park, Chippenham	..	..	..
Glanely, Lord	The Court, St. Fagan's, Glam.	1	0	0
Glover, J.	Cornwood, S. Devon	1	0	0
Glyn, Sir R. F., Bart.	The Cross House, Fontnell Magna, Shaftesbury	1	0	0
Godfrey, J. B.	Downside Farm, Shepton Mallet	1	0	0
†Godman, C. B.	Woldringfold, Horsham	..	..	..
Godman, J.	The Raswells, Hascombe, Godalming	1	0	0
Godwin, Warren and (Co., Ltd)	140, Redcliffe Street, Bristol	1	0	0
†Goldney, Sir Prior, Bart., C.B.	Derriads, Chippenham	..	..	..
Goodchild, G. A.	The Oak House, Great Yeldham, Essex	1	1	0
Goodden, J. R. P.	Compton House, Sherborne	1	0	0
Goodman, A. & Sons	3, Hammett Street, Taunton, and Broad St. House, London, E.C.	1	0	0
*Gordon, Major R.G.S., M.C.	Langton House, Blandford	2	0	0
Gordon, G. H.	The Barn House, Sherborne	1	0	0
Goring, C.	Wiston Park, Steyning	1	0	0
†Gorrington, Hugh	Kingston-by-Sea, Brighton	..	..	..
Graham, Marchioness of	Easton Park, Suffolk	1	0	0
Grace A.	39, Welsh Back, Bristol	1	0	0
Grant-Ives, C. E.	Bradden House, Towcester, Northamptonshire	1	0	0
Grant, W. J.	Pentonville, Newport, Mon.	1	0	0
Gray, R.	The Estate Office, Sherborne	1	0	0
Greaves, R. M.	Wern, Portmadoc, North Wales	1	0	0
Green, E. A.	Cobe Grange, Westbury-on-Trym, Bristol	1	0	0
†Greenall, Mrs. C. E.	The Manor, Carlton Scroop, Grantham	..	..	..
†Greenall, Sir G., Bart	Walton Hall, Warrington	..	..	..
Greenway, W.	Halse, Taunton	1	0	0
Greenwell, Sir B., Bart.	Marden Park, Woldingham, Surrey	1	0	0
Greenwood, J. C.	Claverton Down, Bath	1	0	0
Gregory, W.	Wellington, Somerset	1	0	0
†Guest, Miss	Inwood, Templecombe	..	..	..
†Guest, Lady Theodora	Inwood, Templecombe	..	..	..
Guille, H. C. de Stevens	St. George, Castel, Guernsey	1	0	0
Guise, Sir W. F., Bart.	Elmore Court, Gloucester	1	0	0
Gunther, C. E.	Tongswood, Hawkhurst, Kent	1	0	0

Name.	Residence.	Subscriptions.		
		£	s.	d.
Habgood, G. . . . .	Harley Lodge, Wimborne . . .	1	0	0
Hall, A. C. . . . .	The Manor, Great Rolbricht, Chipping Norton . . . . .	1	0	0
*Hambleton, Viscount . . .	Greenlands, Henley-on-Thames .	5	0	0
*Hambro, Sir E. A., K.C.V.O. .	Hayes Place, Kent . . . . .	2	0	0
Hamilton, Capt. H. P. . . .	Breinton, Hereford . . . . .	1	1	0
Hancock, Rev. Preb. F. . . .	The Priory, Dunster, Somerset .	1	0	0
Hancock, H. C. . . . .	The Court, Milverton, Taunton .	1	0	0
Hancock, Mrs. R. D. . . . .	Halse, Taunton . . . . .	1	0	0
Hanks, W. . . . .	Aston Magna, Moreton-in-Marsh .	1	0	0
Harbottle, E. H. . . . .	Topsham, Devon . . . . .	1	0	0
Harditch, A. . . . .	Shipway Gate Farm, Portbury, Bristol . . . . .	1	0	0
Hardwick, A. . . . .	Easton in Gordano, Bristol . . .	1	0	0
Harris, C. & T. & Co. (Ltd.) .	Bacon Curers, Calne, Wilts . . .	1	0	0
Harris, H. . . . .	Singleton Park Farm, Sketty, S.O., Glam. . . . .	1	0	0
Harris, J. M. . . . .	Chilvester Lodge, Calne, Wilts .	1	0	0
Harrison, D. . . . .	The Grove, Tenby . . . . .	1	0	0
Harrison, L. and Co. . . . .	Pedigree Stock Farms, Coolham, Horsham, Essex . . . . .	1	0	0
Harrison, McGregor & Co. . .	Leigh, Lancashire . . . . .	1	0	0
Hart, W. H. . . . .	Home Farm, Biddestone, Chip- penham . . . . .	1	0	0
Hartley, Major H. B. . . . .	Tytherington, Heytesbury, Wilts .	1	0	0
Haward, T. W. . . . .	Margam, Port Talbot, South Wales . . . . .	1	1	0
Hawkins, A. W. Bailey . . . .	Stagenhoe Park, Welwyn, Herts .	1	0	0
†Haydon, Lt.-Col. W. H. . . .	Maidford, Malmesbury, Wilts . .	..		
Hayes-Sadler, Mrs. A. F. . . .	44, Curzon Street, London, W.1 .	1	0	0
Hayes, F. J. . . . .	West Pennard, Glastonbury . . .	1	0	0
Heathcoat-Amory, Sir I. M., Bart. . . . .	Hensleigh, Tiverton, Devon . . .	1	0	0
Heneage, Capt. R.N. . . . .	Parc le Breos, Penmaen, Glam. .	1	0	0
Henry, Lt.-Col. F. . . . .	Elmstree, Tetbury . . . . .	1	0	0
Heppel, E. M. . . . .	Camerton, near Bath . . . . .	1	0	0
Heseltine, Lt.-Col. J. E. N. . .	Etchinhampton House, Devizes . .	1	0	0
Hesse, F. W. . . . .	Weston Hill, Weston Park, Bath .	1	1	0
†Hewitt, G. Southby . . . . .	Day, Son & Hewitt, 22, Dorset Street, London, W.1 . . . . .	..		
Hick, G. H. . . . .	Wayfield, Batheaston, Bath . . .	1	0	0
Hick, W. A. . . . .	Wayfield, Batheaston, Bath . . .	1	0	0
Hicks-Beach, Lady Susan . . .	Coln S. Eldwyn, Fairford, Glos. .	1	0	0
Higgins, B. . . . .	Millhouse Farm, Evercreech . . .	0	10	0
Hignett, G. . . . .	Hodshill, Southstoke, Bath . . .	1	1	0
Hignett, Mrs. G. . . . .	Hodshill, Southstoke, Bath . . .	1	1	0
†Hill, B. H. . . . .	Uphill, Weston-super-Mare . . . .	..		
Hill, H. . . . .	Paulton, near Bristol . . . . .	1	1	0
Hill, S. . . . .	Langford House, Churchill, Bristol	1	0	0



Name.	Residence.	Subscriptions.		
		£	s.	d.
Hill, Major V. T.	Woodspring Priory, near Weston-super-Mare	1	1	0
†Hinckes, Captain R. T.	Mansel Court, Mansel Lacey, Hereford	..	..	..
Hippisley & Sons	Wells, Somerset	1	0	0
Hippisley, R. J. B.	Ston Easton Park, Bath	1	0	0
Hiscock, Victor	France Farm, Blandford	1	1	0
Hitch, W. H.	Manor House, Elkstone, Cheltenham	1	0	0
†Hoare, Sir H. H. A., Bart.	Stourhead, Zeals, S.O., Wilts	..	..	..
*Hobhouse, Rt. Hon. H.	Hadspen House, Castle Cary	2	0	0
†Hoddinott, S.	Woodford, Wells, Somerset	..	..	..
Holford, Mrs. Gwynne	Buckland, Bwlch, Breconshire	1	0	0
Holt Needham, O. N.	Barton Court, Colwall, nr. Malvern	1	0	0
Hookey, T. F.	Dry Drayton, Cambridge	1	0	0
†Horner, Sir J. F. Fortescue	Mells Park, Frome	..	..	..
Horsington, C.	Fenny Castle, Wookey, Wells	1	0	0
Horton-Starkie, Rev. Preb. Le G. G.	Wellow Vicarage, Bath	1	1	0
Hosegood, A. W.	Williton, Taunton	1	0	0
Hosegood, Obed., jun.	Dillington, Ilminster	0	10	0
†Hoskins, R. J.	Beaumont, Cannard Grove, Shepton Mallet	..	..	..
Hoskyns, H. W. P.	North Perrott Manor, Crewkerne, Somerset	1	0	0
House, V. J.	Walcombe, Wells	1	0	0
Howard, A.	Thornbury Castle, Gloucester	1	0	0
†Hughes, A. E.	The Laurels, Bargates, Leominster	..	..	..
Humphries, Sidney	Eastfield Lodge, Westbury-on-Trym, Bristol	1	1	0
†Hurle, J. C.	Brislington Hill, Bristol	..	..	..
Hurle, Major J. A. Cooke	Yarlington House, Wincanton	1	0	0
Hurst & Son	152, Houndsditch, London, E.1.	1	0	0
*Hussey A. H.	Maincombe, Crewkerne	2	0	0
Hutton, K. M.	East Farm, Affpiddle, Dorchester	1	0	0
†Hylton, Lord	Charlton, near Radstock	..	..	..
Ibbotson, R.	The Hawthorns, Knowle, Warwickshire	1	0	0
*Ilchester, Earl of	Melbury, Dorchester	2	2	0
Imbert-Terry, Capt.	Blue Hayes, Broadclyst, Devon	1	0	0
Imbert-Terry, Mrs. L.	Blue Hayes, Broadclyst, Devon	1	0	0
Imperial Live Stock Insurance Co.	17, Pall Mall, East, London, S.W.	1	0	0
International Harvester Co. (Ltd.)	80, Finsbury Pavement, London, E.C.	1	0	0
Ireland, A. C.	Brislington Hill, near Bristol	1	1	0

Name.	Residence.	Subscriptions.		
		£	s.	d.
Irvine, H. O. . . . .	Southerndown, Bridgend, Glam. . .	1	0	0
*Islington, Lord . . . .	Hartham Park, Corsham . . . .	2	0	0
*Ismay, J. H. . . . .	Iwerne Minster, Blandford, Dorset	2	0	0
Itchen Breeding Stock Farms (Ld.) . . . . .	Itchen Abbas, near Winchester . .	1	0	0
Jackman, Percy . . . . .	Pultney Hotel, Bath. . . . .	1	0	0
Jackson, Sir Henry Mather. Bart. . . . .	Llantillio Court, Abergavenny . .	1	0	0
James, W. R. . . . .	Binegar, Bath . . . . .	1	0	0
James, E. J. T. . . . .	Dulcote Farm, Wells . . . . .	1	0	0
James, Mark . . . . .	Home Farm, Ston Easton, Bath . .	1	0	0
Jardine, John . . . . .	The Park, Nottingham . . . . .	1	1	0
Jarmain, T. M. . . . .	Haseley Iron Works, Tetsworth . .	1	1	0
Jenkins, D. . . . .	Flemingstone Court, Cowbridge, Glam. . . . .	1	0	0
Jenkins, E. . . . .	c/o F. Capern, Lewin's Mead, Bristol . . . . .	1	0	0
Jenkins, T. E. . . . .	Kilvrough Home Farm, Park Mill, S.O., Glamorgan . . . . .	1	0	0
Jenkins, Captain Vaughan .	St. Winifreds, Combe Down, Bath	1	0	0
*Jersey, Earl of . . . . .	Middleton Park, Biester, Oxon . .	2	0	0
†Jervoise, Mrs. B. A. L. . .	Herriard Park, Basingstoke . . .	..		
Jervoise, F. H. T. . . . .	Herriard Park, Basingstoke . . .	1	1	0
Jeyes' Sanitary Compounds Company . . . . .	Cannon Street, London, E.C.4. . .	1	0	0
John, E. . . . .	Cowbridge, Glamorgan . . . . .	1	0	0
Johnstone, F. E. . . . .	Burghclere, Newbury. . . . .	1	0	0
Joicey-Cecil, Col. The Lord John . . . . .	Chute Lodge, Andover . . . . .	1	0	0
Jones, T. S. . . . .	Frondez, Radyr, Cardiff . . . . .	1	0	0
Jones & Son . . . . .	Tolbury Mills, Bruton . . . . .	1	1	0
*Joyce, Rev. W. W. . . . .	Charles Parsonage, South Molton .	2	0	0
Kay-Mouat, Miss K. . . . .	The Firs Farm, Malvern Wells . .	1	0	0
*Kearse, A. . . . .	Manor Farm, Latton, Cricklade, Wilts . . . . .	2	2	0
Keeling, G. . . . .	North Hill Farm, Dunkerton, Bath . . . . .	1	0	0
Keen, T. R. W. . . . .	Crannell Farm, Polsham, Wells . .	1	0	0
Keen, R. T. . . . .	Furlong Farm, Westbury-sub- Mendip . . . . .	1	0	0
Kekewich, T. H., J.P. . . .	Peamore, Exeter . . . . .	1	0	0
Kell & Co. . . . .	Gloucester . . . . .	1	0	0

Name.	Residence.	Subscriptions.		
		£	s.	d.
Kelly, Col. A. L.	Cadbury House, Wincanton, Somerset	1	0	0
Kelway, W.	Huish Episcopi, Langport	1	1	0
†Kemp, L. J.	Maer, Exmouth	..	..	..
Kennaway, Sir J., Bart.	Escot, Ottery St. Mary	1	0	0
*Keyser, C. E.	Aldermaston Court, Reading	2	0	0
Kidner, S., O.B.E.	Bickley, Melverton, near Taunton	1	0	0
Kidston, G.	Hazlebury, Box, Wilts	1	0	0
Killen, J. J.	Rood Farm, Butleigh, Glastonbury	1	0	0
Killen, C. J.	Middle Farm, West Horrington, Wells	1	0	0
Killen, R.	Manor Farm, Farrington Gurney, Bristol	1	0	0
King & Sons, R.	Milsom Street, Bath	1	1	0
Knight-Bruce, R.	The Sanctuary, Shobrooke. Credton	1	0	0
Knight, S. J.	Buckingham Lodge, Keynsham, Bristol	1	0	0
†Knollys, C. R.	Weekley, Kettering	..	..	..
Knox, E.	Kilmersdon, Bath	1	1	0
†Kruze, W.	St. Blazey, Par Station, Cornwall	..	..	..
†Lake, C.	Glenthorne, Gravesend	..	..	..
*Lansdowne, Marquis of	Bowood, Calne	2	0	0
Larkworthy, E. W.	Messrs J. L. Larkworthy & Co., Worcester	1	1	0
†Latham, T.	Dorchester, Oxon	..	..	..
Lauder, J.	Lydney Park, Gloucester	1	0	0
Laurie, A. Dyson	Stone Street Farm, Sevenoaks	1	0	0
Lawes, Algernon (Ltd.)	203, Hornsey Road, London, N.7	1	1	0
Lear, H. H.	Farms Office, Easton Park, Wickham Market, Suffolk	1	0	0
Leeder, E. H.	Mount Pleasant House, Swansea	1	0	0
Lethbridge, Charles	Carlton Club, London, S.W.	1	0	0
Leverton, W. A.	Columb John Farm, Stoke Canon, Exeter	1	0	0
Leverton, W.	Woolleigh Barton, Beaford, North Devon	0	10	0
Lewis, Col. H.	Green Meadow, near Cardiff	1	1	0
Lewis, Wm. & Son (Ltd.)	Herald Office, Bath	1	0	0
†Ley, John Henry	Trehill, Exeter	..	..	..
†Leyland, C. J.	Haggerston Castle, Beal, North- umberland	..	..	..
Lickiss, A. L., Managing Director,	Waterloo Mills Cake and Ware- housing Company, Hull	1	0	0

Name.	Residence.	Sub-
		scriptions.
		£ s. d.
Liddell, Capt. C. O. . . .	Shire Newton Hall, Chepstow . .	1 1 0
Liddon, E., M.D. . . . .	Silver Street House, Taunton . .	1 0 0
Lipscomb, Godfrey . . . .	Margam Park, Port Talbot . . .	1 0 0
Lister, R. A. & Co. (Ltd.). .	Dursley, Glos. . . . .	1 1 0
†Lister, J. J. . . . .	Warninglid Grange, Haywards Heath . . . . .	..
Llewellyn, Lieut.-Col. A. . .	Writtenhall, Bewdley, Worcester- shire . . . . .	1 0 0
Llewellyn, Capt. Llewellyn T. E. . . . .	Hackwood, Basingstoke . . . .	1 0 0
*Llewellyn, Sir J. T. D., Bart.	Penllergaer, Swansea . . . . .	2 2 0
*†Long, Rt. Hon. Walter H., M.P. . . . .	Rood Ashton, Trowbridge . . .	..
Long, Col. William . . . .	Woodlands, Congresbury, Somerset	1 0 0
Long, W. F. . . . .	Broadway House, Chilcompton, Near Bath . . . . .	1 0 0
Longrigg, G. E. . . . .	Weston Lea, Bath . . . . .	1 0 0
Lopes, Sir H. Y. Buller, Bart.	Maristow, Robprough, Devon . .	1 0 0
Lord Wandsworth Institution . . . . .	Long Sutton, Winchfield, Hants .	1 0 0
Loveless, J. D. . . . .	Melton Lodge, Neva Road, Weston-super-Mare . . . . .	1 0 0
Loxton, J. . . . .	Hurn Farm, Wookey, Wells . . .	1 0 0
Lubbock, Major G. . . . .	Greenhill, Warminster, Wilts . .	1 0 0
Luckes, S. . . . .	Bridge Street, Taunton . . . .	1 0 0
Ludlow, Lady . . . . .	Luton Hoo, Luton . . . . .	1 0 0
*Luff, J. Purnell . . . . .	The Towers, Evercreech, Bath . .	2 2 0
Lupton, N. . . . .	Chalmington, Cattistock, Dorset .	1 0 0
†Lutley, J. H. . . . .	Brockhampton, Worcester . . .	..
Luttrell, Capt. A. F. . . .	Court House, East Quantoxhead, Bridgwater . . . . .	1 0 0
Luttrell, Claude M. F. . . .	Benmead, Box, Wilts . . . . .	1 1 0
MacGregor, Brigadier-General W. . . . .	Claverton Rectory, Bath . . . .	1 0 0
Macdonald, H. L. S. . . . .	Avondale, Bathford, Bath . . .	1 0 0
Macleod, Mrs. . . . .	Woodford House, Chew Stoke, near Bristol . . . . .	1 0 0
Major, H. J. and C. (Ltd.) . .	Bridgwater . . . . .	1 0 0
†Mansell, A. E. . . . .	Mount Vernon, Melton Mowbray, Ta-mania . . . . .	..
Marcus, M. . . . .	High Trees, Redhill, Surrey . .	1 0 0
Marfell, R. H. . . . .	Great House Farm, Llangeview, Usk	1 0 0
Marshall, H. C., C.C., . . .	Wrighton, Somerset . . . . .	1 0 0
Marshall, L. H. . . . .	Chippenham . . . . .	1 0 0
Marshall, Sons & Co. (Ltd.).	Britannia Iron Works, Gains- borough . . . . .	1 0 0

Name.	Residence.	Subscriptions.
		£ s. d.
Martin, Col. . . . .	Bishops Caudle, Sherborne. . . . .	1 0 0
Martin, Mrs. . . . .	Bishops Caudle, Sherborne. . . . .	1 0 0
Martin, J. . . . .	Thorverton, R.S.O., Devon . . . . .	1 0 0
Martin, L. J. (Associated Manufacturers' Assn.) . . . . .	72-80, Mansell Street, Aldgate, London, E.1 . . . . .	1 0 0
Martin, W. . . . .	Colleton, near Chulmleigh . . . . .	1 0 0
Martyn, G. . . . .	Tremeddan, Liskeard, Cornwall . . . . .	1 0 0
Mason, F. F. . . . .	Swansea . . . . .	1 0 0
Massey-Harris Co. (Ltd.), (C. W. Dawkins, General Manager) . . . . .	54 & 55, Bunhill Row, London, E.C.1 . . . . .	1 0 0
Masters, A. . . . .	Kynetton, Thornbury, Glos. . . . .	1 0 0
Mathews, Ernest . . . . .	Little Shardeloes, Amersham, Bucks . . . . .	1 0 0
Matthews, H. . . . .	Winterbourne, Bristol . . . . .	1 1 0
May, E. Howard, c/o May and Hassell, (Ltd.) . . . . .	Baltic Wharf, Bristol . . . . .	1 0 0
Meager, F. F. . . . .	Melbourne House, Swansea . . . . .	1 0 0
Meddick, William G. . . . .	11, Great Stanhope Street, Bath . . . . .	1 0 0
Membery, R. . . . .	37, Southgate Street, Bath . . . . .	1 0 0
Merry, Richard . . . . .	Goulds, Broadclyst, Exeter . . . . .	0 10 0
Merson, T. H. . . . .	Farington, N. Petherton, Bridg- water . . . . .	1 0 0
*Methuen, General Lord, C.B., C.M.G. . . . .	Corsham Court, Wilts . . . . .	2 0 0
*Methuen, Hon. Paul . . . . .	Beanacre Manor, Melksham . . . . .	2 0 0
Mildmay, Capt. C. B. St. J. . . . .	Hallam, Dulverton . . . . .	1 0 0
†Mildred, G. B. . . . .	. . . . .	..
†Miles, Lieut.-Col. Sir Charles W., Bart. . . . .	Charlton, Portbury, Bristol . . . . .	..
Miles, H. . . . .	Auctioneer, Farrington Gurney, Bristol . . . . .	1 0 0
Millard, F. J. . . . .	Bridge Farm, Butleigh, Glastonbury . . . . .	1 0 0
Miller-Hallett, A. . . . .	Goddington, Chelsfield, Kent . . . . .	1 1 0
Mills, B. W. . . . .	31, Cambridge Place, Paddington, London, W. . . . .	1 0 0
Mitchell, Mrs. C. L. . . . .	Highgrove, Tetbury . . . . .	1 0 0
Mitchell, T. E. . . . .	Tan House, Bromyard, near Worcester . . . . .	1 1 0
Molassine Co. (Ltd.) . . . . .	East Greenwich, London, S.E. . . . .	1 0 0
Mond, Sir Alfred . . . . .	Melchet Court, Romsey . . . . .	1 0 0
Moody, C. . . . .	Mai'emoor, Evercreech . . . . .	1 0 0
Moody, G. W. . . . .	Stapleton, Martock, Somerset . . . . .	1 0 0
Moore-Gwyn, J. E. . . . .	Duffryn, Neath, Glamorgan. . . . .	1 0 0
†Moore, H. F. . . . .	Renée House, 48, Dulwich Road, Herne Hill, S.E.24 . . . . .	..
†Moore-Stevens, J. R. C. . . . .	Winscott, Torrington, Devon . . . . .	..

Name.	Residence.	Subscriptions.		
		£	s.	d.
Moore-Stevens, Col. R. A. . . . .	Winscott, Torrington, Devon . . . . .	1	0	0
Morant, Lady, K. F. . . . .	Brokenhurst Park, Hants . . . . .	1	0	0
Morel, C. E. . . . .	. . . . .	1	0	0
*Morley, Earl of . . . . .	Saltram, Plympton, Devon . . . . .	2	0	0
*Morris, C. . . . .	Highfield Hall, St. Albans . . . . .	2	0	0
Morris and Griffin (Ltd.) . . . . .	Maindee, Newport, Mon. . . . .	1	1	0
Morris, Sir R. A., Bart. . . . .	Sketty Park, Swansea . . . . .	1	0	0
Morris, Son and Peard . . . . .	Auctioneers, North Curry, Taunton . . . . .	1	0	0
*Morrison Hugh, M.P., . . . . .	Fonthill, Tisbury, Wilts . . . . .	2	2	0
Morrison, Major J. A., D.S.O . . . . .	Berwick House, Hindon, Salisbury . . . . .	1	0	0
†Morrison, J. A. . . . .	Basildon Park, Reading . . . . .	..		
Mortimore A. J. . . . .	Basildon Home Farm, Reading . . . . .	1	0	0
Mount-Edgumbe, Earl of . . . . .	Mount Edgumbe, Devonport . . . . .	1	1	0
†Mucklow, E., J.P. . . . .	Woodhill, Bury, Lancashire . . . . .	..		
*Munn, F. S. . . . .	Dumballs Road, Cardiff . . . . .	2	0	0
Muntz, Mrs. J. O. . . . .	Foxhams, Horrabridge, S. Devon . . . . .	1	0	0
Murch, J. . . . .	Charlton Mackrell . . . . .	1	0	0
Murray-An Ierdon, H. Edwd. . . . .	Henlade House, Taunton . . . . .	1	1	0
Nap'ér, H. B. . . . .	Ashton Court Estate Office, Long Ashton, Bristol . . . . .	1	1	0
Neagle, D. T. . . . .	London, Gloucester and N. Hants Co. (Ld.), 25, Whatley Road, Clifton, Bristol . . . . .	1	0	0
Neal, Mrs. G. . . . .	Kingsdon, Taunton . . . . .	1	1	0
Neeld, Sir A. D., Bart., C.B. . . . .	Grittleton, Chippenham . . . . .	1	0	0
Nelder, C. W. . . . .	Carnarvon Arms, Dulverton, Somerset . . . . .	0	10	0
*Nerincs, P. . . . .	Itchen Abbas, near Winchester . . . . .	2	0	0
†Neville, Lieut.-Commander Ralph, R.N. . . . .	Butleigh, Glastonbury . . . . .	..		
†Neville-Grenville, Robert . . . . .	Butleigh Court, Glastonbury . . . . .	..		
Newall, R. S. . . . .	Fisherton de la Mere, Wyle, Wilts . . . . .	1	1	0
New, H. G. . . . .	Craddock, Cullompton, Devon . . . . .	1	0	0
Newington, C. . . . .	Oakover, Ticehurst, Sussex . . . . .	1	..	0
Newman, Sir R. H. S., Bart., D.L., M.P. . . . .	Mamhead Park, near Exeter . . . . .	1	1	0
Nicholetts, E. C. . . . .	The Lons, Bitton, Gloucestershire . . . . .	1	0	0
Nichols, G. . . . .	Damerara House, Colston Avenue, Bristol . . . . .	1	0	0
Nicholson, R. . . . .	Woodcott, Whitechurch, Hants . . . . .	1	0	0
Nitrogen Fertilisers (Ltd.) . . . . .	Winchester House, Old Broad Street, London, E.C.2 . . . . .	1	0	0
Nix, J. A. . . . .	Tilgate, Crawley, Sussex . . . . .	1	1	0
Nixon, W. . . . .	The Cottage, Offchurch, Leamington . . . . .	1	0	0
*Normanton, Earl of . . . . .	Somerley, Ringwood . . . . .	2	0	0
Northey, G. J. P. . . . .	Cheney Court, Box, Wilts . . . . .	1	0	0

Name.	Residence.	Subscriptions.		
		£	s.	d.
*Northumberland, Duke of	Albury Park, Guildford . . . . .	2	0	0
Nurse, F. G. . . . .	Wick Farm, Coxley, Wells . . . . .	1	0	0
Nutt, Mrs. H. J. . . . .	Hampton House, Hampton in Arden, Warwick . . . . .	1	0	0
Oakes, Mrs. W. . . . .	Graslawn House, Exeter . . . . .	1	1	0
Oakey, G. . . . .	Brittleware Farm, Charlwood, Surrey . . . . .	1	0	0
†O'Hagan, Lord . . . . .	Pyrgo Park, Havering Atte Bower, Romford, Essex . . . . .	..	..	..
*†Oppenheimer, B. . . . .	Sefton Park, Stoke Poges, Bucks . . . . .	..	..	..
Osmond and Son . . . . .	Grimsby . . . . .	1	0	0
Owen, Major W. L. . . . .	Luntley Court, Pembridge, near Leominster . . . . .	1	0	0
Paddison, W. P. . . . .	Research Department, Royal Arsenal, Woolwich, London, S.E.18 . . . . .	1	0	0
Paget, L. C. . . . .	Middlethorpe Hall, Yorks . . . . .	1	0	0
*Paget, Sir Richard, Bart.	74, Strand, London, S.W.1 . . . . .	2	0	0
Palmer, A. . . . .	Land Agent, Wells . . . . .	1	0	0
Palmer Tyre (Ld.) . . . . .	119, 121 and 123, Shaftesbury Avenue, London, W.C.2 . . . . .	1	0	0
Palmer, Brigadier-General, G. LL., C.B., M.P. . . . .	Lackham, Lacock, Wilts . . . . .	1	0	0
†Palmer, R. . . . .	Lodge Farm, Nazeing, Waltham Cross, Essex . . . . .	..	..	..
Palmer, W. H. . . . .	York Buildings, Bridgwater . . . . .	1	0	0
Palmer, W. Howard . . . . .	Heathlands, Wokingham, Berks . . . . .	1	0	0
Palmer, Mrs. W. Howard . . . . .	Heathlands, Wokingham, Berks . . . . .	1	0	0
Parham, B. . . . .	Norington, Alvediston, Salisbury . . . . .	1	1	0
†Parker, Hon. Cecil T. . . . .	The Grove, Corsham, Wilts . . . . .	..	..	..
Parker, F. J. . . . .	Plymouth Street, Swansea . . . . .	1	0	0
Parmiter, P. J. & Sons . . . . .	Tisbury, Wilts . . . . .	1	0	0
Parry-Okeden, Lieut.-Col. U. E. P. . . . .	Turnworth, Blanford . . . . .	1	0	0
†Parsons, J. D. Toogood . . . . .	Grasmere, East Hoathley, Sussex . . . . .	..	..	..
†Parsons, R. M. P. . . . .	Misterton, Crewkerne . . . . .	..	..	..
Parsons, F. W. . . . .	Speckington, Ilchester . . . . .	1	0	0
Pass, Captain A. D. . . . .	Manor House, Wootton, Fitzpaine, Charmouth, Dorset . . . . .	1	0	0
Pawlyn, J. H. W. . . . .	Orwell Works, Ipswich . . . . .	1	0	0
Peacock, W. . . . .	3, Buckingham Gate, London . . . . .	1	1	0
Pearce, S. & Co. . . . .	46a, Market Street, Manchester . . . . .	1	0	0

Name.	Residence.	Subscriptions.		
		£	s.	d.
Pearce, E. . . . .	Parsonage Farm, Long Ashton, Bristol . . . . .	1	0	0
Pearce, H. J. . . . .	Grange Farm, Portishead . . . . .	1	0	0
Pearce, J. . . . .	Parsonage Farm, Long Ashton, Bristol . . . . .	1	0	0
Pearce, T. H. . . . .	Parsonage Farm, Long Ashton, Bristol . . . . .	1	0	0
Peel, Viscount . . . . .	52, Grosvenor Street, London, W. . . . .	1	1	0
Pember, G. H. . . . .	. . . . .	1	0	0
Penberthy, Professor J. . . . .	Dean Ha'l, Newnham, Glos. . . . .	1	0	0
Pendarves, W. Cole . . . . .	Pendarves, Camborne, Cornwall . . . . .	1	1	0
Pepper, W. F. . . . .	New Rellynch Farm, Bruton . . . . .	1	0	0
Perkins, Col. E. K. . . . .	Shales, Bitterne, Hants . . . . .	1	1	0
Pe herick, R., jun. . . . .	Acland Barton, Landkey, Barn- staple . . . . .	0	10	0
Petters (Ltd.) . . . . .	Yeovil . . . . .	1	0	0
Pettifer, T. & Co. . . . .	Eydon, Banbury . . . . .	1	0	0
Phillips, F. . . . .	Nantcoch, Newport, Mon. . . . .	1	1	0
Phillips, G. . . . .	The Gaer, Newport, Mon. . . . .	1	0	0
Phillips, L. R. . . . .	. . . . .	1	1	0
Piggott, Brothers & Co. . . . .	220, 222, 224, Bishopsgate Street, Without, London, E.C. . . . .	1	0	0
Pike, C. A. . . . .	Chilean Nitrate Committee, Friar's House, 39-41, New Broad Street, London, E.C.2 . . . . .	1	0	0
†Pinney, R. W. P. . . . .	Sutton Veny, Warminster . . . . .	..		
†Pitt, W. . . . .	South Stoke House, Bath . . . . .	..		
Plumptre, H. F. . . . .	Goodnestone, Dover . . . . .	1	0	0
*Plymouth, Earl of . . . . .	Hewell Grange, Bromsgrove . . . . .	4	0	0
*Poltimore, Lord . . . . .	Court Hall, North Molton, Devon . . . . .	2	2	0
Ponting, R. . . . .	Dulcote, Wells . . . . .	1	0	0
Poole, Mrs. A. R. . . . .	King's Hill, Dursley . . . . .	1	1	0
Poore, M. . . . .	Longstreet House, Enford, Pewsey, Wilts . . . . .	1	0	0
Poore, Mrs. I. . . . .	Longstreet House, Enford, Pewsey, Wilts . . . . .	1	0	0
Pope, Alfred . . . . .	Dorchester . . . . .	1	0	0
Pope, John . . . . .	Nowers, Wellington, Somerset . . . . .	1	0	0
Popham, H. L. . . . .	Hunstrete House, Pensford, Bristol . . . . .	1	0	0
Portal, M. . . . .	Holywell, Swanmore, Hants . . . . .	1	0	0
Porter, W. J. H. . . . .	Glendale Farm, Wedmore . . . . .	1	0	0
†Portman, Hon. C. B. . . . .	Goldicote, Stratford-on-Avon . . . . .	..		
Portman, Hon. Mrs. C. B. . . . .	Goldicote, Stratford-on-Avon . . . . .	1	0	0
Portsmouth, Earl of . . . . .	Barton House, Mordard Bishop, Devon . . . . .	1	0	0
Powell, G. E. . . . .	8, Osborne Road, Clifton, Bristol . . . . .	1	0	0
Powell, G. F. . . . .	10, Beaufort West, Bath . . . . .	1	0	0
Pratt, A. T. . . . .	Morston House, Trimley, Ipswich . . . . .	1	0	0



Name.	Residence.	Subscriptions.		
		£	s.	d.
Price, J. H.	Higher Hill Farm, Butleigh, Glastonbury	1	0	0
Price, Owen	Nantyrharn, Cray, Brecon	1	0	0
Prichard, H. L.	Penmaen, R.S.O., Glam.	1	0	0
Prince, M.	Béckington, Bath	1	0	0
Pritchard, D. F., J.P.	Crumlin Hall, Crumlin, Mon.	1	1	0
Proctor, H. & T. (Ltd.)	Cathay, Bristol	1	1	0
Proudfoot, W.	Woodbourne House, Shepton Mallet	1	1	0
Pullen, James	Lapdown Farm, Tormarton, Gloucester	1	0	0
Pullen, J. W.	Compton Greenfield, Bristol	1	0	0
†Purgold, A. D.	Ebnall Lodge, Gobowen, Salop	..	..	..
*Pyman, Sydney	Pigeon House, Ross-on-Wye	2	2	0
Quantock Vale Cider Co.	North Petherton, Bridgwater	1	0	0
Quested, J. E.	Cheriton, Kent	1	0	0
Quilter, Sir Cuthbert, Bart	Bawdsay Manor, Woodbridge	1	0	0
Radcliffe, Wyndham Ivor	Druidstone, near Cardiff	1	0	0
*†Radnor, Earl of	Longford Castle, Salisbury	..	..	..
Rawlence, Ernest A.	Newlands, Salisbury	1	0	0
Rawlence, G. Norman	Salisbury	1	0	0
†Rawlence, (Capt. N., D.S.O.)	Salisbury	..	..	..
Reakes, O. O.	Masters Farm, Emborough, Bath	1	0	0
Reeves, Robert and John, and Son	Bratton Iron Works, Westbury, Wilts	1	0	0
Reynolds, Sylvanus	Corndean Hall, Winchcombe, Glos.	1	0	0
Reynolds, W. G.	The Crest, Keynsham, Bristol	1	1	0
†Richardson, Capt. A.	Seven Springs, Cheltenham	..	..	..
Richardson, Rev. A.	Bath and County Club, Bath	1	0	0
Riley, J. L. & A.	The Iwerne, near Ledbury	1	0	0
Ringer, A. Beverley.	Swardeston, Norfolk	1	0	0
Robins, J.	High Bray, South Molton	0	10	0
Robins, W. & H. V.	Gratton Barton, High Bray, South Molton	1	0	0
Robinson, E. S. & A. (Ltd.)	Redcliffe Street, Bristol	1	1	0
Robinson, John & Co.	Bristol	1	1	0
Roe, W. J.	West Pennard, Glastonbury	1	0	0
Rogerson, R. W., Ward & Co., Seedsman	Northgate Street, Bath	1	0	0
Rolleston, S. V.	Saltford House, Saltford, Bristol	1	0	0
Rolleston, Col. V., J.P.	Saltford House, near Bristol	1	1	0
Roundway, Lord	Roundway Park, Devizes	1	1	0

Name.	Residence.	Subscriptions.		
		£	s.	d.
Rouse-Boughton, Sir W. St. A., Bart.	Downton Hall, Ludlow	1	0	0
Rouse-Boughton, Lady	Downton Hall, Ludlow	1	0	0
Rowland, P. S.	The Laurels, Llangenneth, Reynoldston, S.O., Glam.	1	0	0
Rowliffe, E. L.	Hall Place, Cranleigh, Guildford	1	1	0
Royal Guernsey Agricultural and Horticultural Society	Guernsey	1	0	0
Rudd, Mrs.	Felbridge Park Farm, East Grinstead, Sussex	1	0	0
Ruston & Hornsby (Ltd.)	Grantham	1	0	0
Rutherford, J. A.	Highelere Estate Office, Newbury, Berks	1	0	0
†St. Audries, Lord	St. Audries, Bridgwater	..	..	..
*St. Germans, Earl of	St. Germans, Cornwall	2	0	0
†Salmon, H. C.	North Field, Bridgwater	..	..	..
Salter, Benjamin	Newlands, Broadclyst, Exeter	1	0	0
Salter, T.	Beare Farm, Broadclyst, Exeter	1	0	0
Samels, J. W.	Perfect Dairy Machines (Ltd.), 105, Middle Abbey Street, Dublin	1	0	0
Samuelson, Ernest	Bodicote Grange, Banbury	1	1	0
Sanders, Lt.-Col. Sir R. A., M.P.	Bayford Lodge, Wincanton	1	0	0
Sanford, Col. E. C. A., C.M.G.	68, St. James Court, Buckingham Gate, London, S.W.1	1	0	0
Sanford, H. S. J. A.	The Court House, Middlehill, Broadway, Worcestershire	1	0	0
Sankey, R. I.	Queen Anne Mansions, St. James's Park, London, S.W.	1	0	0
Sawtell, G. H.	Kingweston, Taunton	1	0	0
†Scott, T.	..	..	..	..
†Seaton, Lord	Beechwood, Plympton, Devon	..	..	..
Senior and Godwin	Auctioneers, Sturminster Newton, Dorset	1	1	0
Shaw, Col. Frank S. Kennedy	Teffont Magna, Salisbury	1	1	0
†Shaw-Stewart, Walter R.	Hayes, Shaftesbury	..	..	..
*Shelley, Sir John, Bart.	Shobrooke Park, Crediton	2	2	0
Shelley, J. F.	Posbury House, near Crediton	1	0	0
Shelley, Mrs. J. F.	Posbury House, Crediton	1	0	0
Sheppard, P. C. O.	Dunraven Estate Office, Bridgend, Glam.	1	1	0
†Sherston, C. J. T.	Harewood, Leeds	..	..	..
*Sidmouth, Viscount	Upottery Manor, Honiton	2	0	0
Shcock, R. & Sons	Stanley Hall, Union Street, Liverpool	1	0	0
Silcox, H. T.	White Hart Hotel, Wells	1	0	0
Sillifant, A. O.	Culm Leigh, Stoke Canon, Exeter	1	0	0

# *Subscriptions.*

clxxxv

Name.	Residence.	Subscriptions.		
		£	s.	d.
*Simpson, Charles (Hornthorn & Co)	7, Lambs Passage, Chiswell Street, London, E C 1	2	0	0
Simpson, F C	Maypool, Churston Ferrers, R S.O., S Devon	1	0	0
*Singer, W M G	42 Charles Street, Berkeley Square, London, W 1	2	0	0
Skinner, G C	Pound, Bishops Lydeard	1	0	0
Slatter, J & Co	Paxford, Campden, S O , Glos	1	0	0
Smart, G E	Combe Hay Manor, Bath	1	1	0
Smith A J (Ltd)	9 Queen's Road, Bristol	1	0	0
Smith, I	Monkton, Hereford	1	0	0
†Smith J W	Thinghill Court, Hereford			
†Smith S Lee	Larkfield, Maidstone			
Smyth, Hon G N	Ashton Court, Bristol	1	0	0
Smyth, Hon Mrs	Ashton Court Bristol	1	0	0
Smyth, P	Bioford, Dulverton	1	0	0
Smyth Richards, G C	Filleigh Lodge, South Molton	1	0	0
*Somerset, Duke of	Maiden Bradley, Bath	2	0	0
Somerset Trading Co (Ltd)	Bridgwater	1	1	0
†Somerville, A F	Dinder House, Wells Somerset			
Southwood, J W	1, St Peters Terrace, Twerton, Bath	1	0	0
Spear Brothers and Clark (Ltd)	Southgate Street Bath	1	0	0
†Spearman, Sir J L F Bart				
Spenceley, Hugh le Dispenser	Ashley House, Box, Wilts	1	0	0
Spencer, W C	Basil & Park Farm, Fawkhambury	1	0	0
Spicer, Capt	Spye Park, Chippenham	1	0	0
Spicer, Lady M	Spye Park, Chippenham	1	0	0
Spiller, T R	Luccombe, Milton Abbas, Blandford	1	0	0
Spillers and Bakers (Ltd)	Canliff	1	1	0
Spratts' Patent (Ltd)	24 and 25, Fenchurch Street, City, London, E C 3	1	0	0
Stallard, A E	Burgate, Fordingbridge, Hants	1	0	0
Stallard, H	Burgate, Fordingbridge, Hants	1	0	0
*†Stanley, E A V				
Stephens, T A	Hookstile House, South Godstone, Surrey	1	0	0
†Stein, Sir Edward D L	Fan Court, Chertsey			
Stevens, R N	Woodham Hall, Woking, Surrey	1	0	0
Stewart, Rev H. J	The Vicarage, Cockett, Glumorgan	1	0	0
Stilgoe, H W	The Grounds, Adderbury, near Banbury, Oxon	1	0	0
Stoddart, F	Manor House, Walton, Clevedon	1	1	0
Stoffell, W M	Fairfield, Newbridge Hill. Bath	1	1	0

Name.	Residence.	Subscriptions.		
		£	s.	d.
Storarr, J. I.	Tredegar Estate Office, Newport, Mon.	1	0	0
Stothert, Sir P. K., K.B.E.	1, Lansdown Place, West, Bath	1	0	0
Stott, A. M.	Hurn Farm, Wookey, Wells	1	0	0
Stott, F. J.	Wellesley Farm, Wells	1	0	0
†Strachie, Lord	Sutton Court, Pensford, Somerset	..		
Strafford, Earl of	Dancers Hill, Barnet	1	0	0
Strangways, Hon. H. B. T.	Shapwick, Bridgwater	1	0	0
Stratton, Richard	The Duffryn, Newport, Mon.	1	0	0
Strawson, G. F., Junr.	St. Andrew's Works, Horley Surrey	1	0	0
Stride, T.	Stanley House, Camden Road, Bath	1	0	0
Strode, G. S. S.	Newnham Park, Plympton	1	0	0
Stucley, H. V. G.	Pillhead, Bideford, North Devon	1	0	0
Studdy, T. E.	Broxton, Paignton	1	0	0
Studley, J. Im.	Toller Fratum, Maiden Newton	1	0	0
Sutherland, R. W. J.	Gadairwen, Croesfaen, Glam.	1	0	0
*Sutton, E. P. F.	Sidmouth Grange, near Reading	2	2	0
*Sutton and Sons	Seedsmen, Reading	2	2	0
Swansea, Lady	Singleton, Swansea	1	1	0
Swanwick, Bruce	The Road House, Rodborough Common, Stroud	1	0	0
Symons, J. & Co. (Ltd.)	The Plains, Totnes	1	1	0
Talbot Miss (Exors of the late)	Margam Park, Port Talbot	1	0	0
Tangyes (Ltd.)	Cornwall Works, Birmingham	1	0	0
Tanner, W.	Redalesdale Hotel, Moreton-in-Marsh	1	0	0
Tapp, David James	Knaplock, Winsford, Dulverton	1	0	0
Tasker W. & Sons (Ltd)	Waterloo Ironworks, Andover	1	1	0
Tate, J. A.	Fairfield, Wells, Somerset	1	0	0
Taverner, G. E.	Budlake, Devon	1	0	0
Taylor, A. H. W.	8, New Bond Street, Bath	1	1	0
Taylor, E.	Red House, Bath	1	1	0
†Taylor, George	Cranford, Hounslow, W.	..		
Taylor, H. W.	The Castle, Yarkhill, Hereford	1	0	0
Taylor L. Acland	City Librarian, Central Library, Bristol	1	0	0
†Tazewell, W. H.	Manor House, Taunton	..		
*Temple, Earl	Newton St. Loe, Bristol	2	2	0
Templeman, G. D.	Hambridge, Curry Rivell, Taunton	1	0	0
Terry, G. A.	Wessex Villa, Odiham, Hants	1	0	0
Thomas, Capt. L. B.	Great Brampton, Madley, Hereford	1	1	0
Thomas, Sir Griffith	Court Herbert, Neath	1	0	0
Thomas, I.	Ely Farm, Cardiff	1	0	0
*Thomas, J.	Velindre, Kidwelly, Carmarthen-shire	2	0	0

Name.	Residence.	Subscriptions		
		£	s.	d.
Thomas, J.	Velindre, Kidwelly . . . .	1	1	0
Thomas, Vice-Admiral, Sir				
Hugh Evan . . . .	Relhap House, Dartmouth. . .	1	1	0
Thomas-Stanford, C. . . .	Preston Manor, Brighton . . .	1	0	0
Thomas & Evans & John				
Dyer (Ltd.) . . . .	Swansea . . . .	1	0	0
Thompson, F. W. E.,				
Wolseley Sheep Shearing				
Machine Co. . . .	Alma Street, Birmingham . . .	1	1	0
Thornercroft, C. E.	Courtlands, Lymptone, Devon . .	1	1	0
Thorne, J. G. . . .	Horridge, Romansleigh, S. Molton	0	10	0
Thornton, W. A.	Lock, Partidge Green, Sussex . .	1	0	0
Thresher, E. B.	Corfe Hill, Weymouth . . . .	1	0	0
Thring, Sir Arthur	Charlton House, Charlton Mackrell	1	0	0
Thurlow, G. R. . . .	Stowmarket . . . .	1	0	0
Thynne, Lt.-Col. U. O.	Muntham Court, Worthing . . .	1	0	0
Tidswell, R. J. . . .	Haresfield Court, Stonehouse, Glos.	1	0	0
Tillard, Rear-Admiral P. F.	Alford House, Castle Cary . . .	1	0	0
Tilley, T. H. . . .	Manor Farm, Biddisham, Av-			
	bridge . . . .	1	0	0
Tipper, B. C. and Son	Balsall Heath, Birmingham . . .	1	0	0
Titt, J. W.	Implement Works, Waiminster . .	1	0	0
Toogood, E. K.	Messrs Toogood & Sons, South-			
	ampton . . . .	1	0	0
Tory, R. . . .	Charisworth, Blandford . . . .	1	0	0
Trafford, G. R.	Hill Court, Ross, Herefordshire .	1	1	0
*Tredegar, Lord	Tredegar Park, Newport, Mon . .	2	2	0
Treffry, I. de C.	Penarwyn, Par Station . . . .	1	1	0
†Tremaine, W. H.	Sherborne, Northleach, Glos. . .	..		
Tremayne, Col. W. F.	Carclews, Perran ar Worthal, Truro	1	1	0
Treowen, Lord	Llanarth Court, Raglan, Mon. . .	1	0	0
Trotman, A. W.	Langston Court, near Newport,			
	Mon. . . .	1	0	0
Trotter Miss . . . .	Chatley, Norton St. Philip, Bath	1	1	0
Troup, Lt.-Col. Alan G., D S O	Dogdean, Salisbury . . . .	1	0	0
Trump, W. . . .	Borough Farm, Broadclyst,			
	Exeter . . . .	1	0	0
Tucker, M. & Sons . . . .	Broad Quay, Bath . . . .	1	0	0
†Tudway, C. C.	The Cedars, Wells, Somerset . .	..		
Turnor, Lt.-Col. W. W.	Pinkney Park, Chippenham. . . .	1	0	0
Uncles, B. . . .	21, Trowbridge Road, Bradford-on-			
	Avon . . . .	1	0	0
Unite, John (Ltd.) . . . .	291, Edgware Road, London, W.2	1	1	0
Utey, T., Jun. . . .	Lyndhurst, Knocklaid Road,			
	Liverpool . . . .	1	0	0

Name.	Residence.	Subscriptions.	
		£	s. d.
†Vacher, E. P. . . . .	Cowfold Lodge, Cowfold, Sussex . . . . .	..	..
Vaughan, Rev. Preb. . . . .	The Rectory, Wraxall, Somerset . . . . .	1	0 0
Veitch, P. . . . .	Exeter . . . . .	1	0 0
Venning, H. B. . . . .	Willetts, Bicknoller, Taunton . . . . .	1	0 0
†Verulam, Earl of . . . . .	Gorhambury, St. Albans . . . . .	..	..
Vine & Co. (Ltd.) . . . . .	Cornhill Chambers, Swansea . . . . .	1	1 0
Vivian, Miss D. E. . . . .	Clyne, Blackpyl, S. Wales . . . . .	1	1 0
Waide, W. and Sons . . . . .	Churn Works, Leeds . . . . .	1	0 0
Wainwright, C. Donald . . . . .	Summerleaze, Shepton Mallet . . . . .	1	1 0
Waldegrave, Earl . . . . .	Chewton Priory, Somerset . . . . .	1	0 0
Walker, E. G. F. . . . .	The Hollies, Chew Stoke, Bristol . . . . .	0	10 0
Walker, H. . . . .	Cook's Folly, Bristol . . . . .	1	0 0
†Walker, J. . . . .	Knightwick Manor, Worcester . . . . .	..	..
Wallis and Stevens . . . . .	North Hants Iron Works, Basingstoke . . . . .	1	0 0
Walrond, Hon. Mrs. C. M. I. . . . .	Bradfield, Cullompton . . . . .	1	1 0
†Walsingham, Lord . . . . .	Merton Hall, Thetford, Norfolk . . . . .	..	..
Ward, J. E. . . . .	Red Lodge, Purton, Wilts . . . . .	1	0 0
Ward, R. B. . . . .	Westwood Park, Droitwich . . . . .	1	0 0
Wardlaw, H. and A. . . . .	Holway Farm, Sherborne . . . . .	1	0 0
+Waring, C. E. . . . .	Conservative Club, Cardiff . . . . .	..	..
†Warner, Col. Sir Courtenay, . . . . .			
Bart, C.B., M.P. . . . .	Bretterham Park, Suffolk . . . . .		
Warren, W. J. . . . .	Deacons Farm, Staplegrove, Taunton . . . . .	1	0 0
Warry, Col. B. . . . .	Shapwick, Bridgwater . . . . .	1	0 0
Waterloo Mills Cake and Warehousing Co. (Ltd) . . . . .	Wilmington, Hull . . . . .	1	0 0
Watson, H. R. . . . .	Purse Caundle, Sherborne . . . . .	1	0 0
Watson, Sir T. E., Bart . . . . .	St. Mary's Lodge, Newport, Mon . . . . .	1	0 0
Watson, Capt. Hon T. H. . . . .	Cormiston, Milverton, Somerset . . . . .	1	0 0
Watts, Mrs. E. . . . .	Eastwood Park, Falfield, Glos . . . . .	1	0 0
Watts, J. . . . .	Backwell, near Bristol . . . . .	1	0 0
*Way, General N. S. . . . .	Manor House, Henbury, Bristol . . . . .	2	0 0
Weaver & Co. . . . .	Beaufort Warehouses, Swansen . . . . .	1	0 0
Webb, E. and Sons . . . . .	Wordsley, Stourbridge . . . . .	1	0 0
Webb, Lieut.-Col. Sir H. . . . .	Llwynarthen, Cardiff . . . . .	1	0 0
Weech, J. & Sons . . . . .	Maudlin Street, Bristol . . . . .	1	1 0
Weeks, E. . . . .	Wraxall, Shepton Mallet . . . . .	1	0 0
Welch-Thornton, H. . . . .	Beaurepaire, Basingstoke . . . . .	1	1 0
Wessex Associated News (Ltd.) . . . . .	Westgate Street, Bath . . . . .	1	0 0
West, E. P. . . . .	Secretary-Manager, University of Bristol Research Station, Long Ashton, Bristol . . . . .	1	0 0

Name.	Residence.	Subscriptions.		
		£	s.	d.
Western Australia, Agent	Savoy House, Strand, London,			
General for . . . . .	W.C.2 . . . . .	1	1	0
Westminster, Duke of. . . . .	Eaton Hall, Chester . . . . .	1	1	0
Weston, H. and Sons . . . . .	The Bounds, Much Marcle, <i>via</i>			
	Dymock, Herefordshire . . . . .	1	0	0
Whatley, Charles W. . . . .	Burderop, Swindon . . . . .	1	0	0
Wherry, E. . . . .	Bourne, Lincolnshire . . . . .	1	0	0
Whitaker, O. H. . . . .	Savoy House, Strand, London,			
	W.C.2 . . . . .	1	0	0
†White, A. R., O.B.E. . . . .	Charnage, Mere, Wilts . . . . .			
White, F. . . . .	Torweston, Williton . . . . .	1	0	0
White, J. H. . . . .	Bagborough Farm, Shepton Mallet	1	1	0
*†White, Sir G. Stanley, Bart	Hollywood Towers, near Bristol . . . . .			
White, W. J. S. . . . .	Zeals Park, Wiltshire . . . . .	1	0	0
Whitehead, A. . . . .	Lydford Park Farm, West Lydford	1	0	0
Whitehead, J. . . . .	Lower Hill Farm, Butleigh, Glas-			
	tonbury . . . . .	1	0	0
Whitley, S. R. . . . .	Rookwood, Shinfield, Reading . . . . .	1	0	0
Whitley, W. and H. . . . .	Primley Farm, Paignton . . . . .	1	0	0
Whitting, C. E. . . . .	Uphill Grange, Weston-super-Mare	1	1	0
Wickham, C. E. . . . .	Palace Farm, Wells . . . . .	1	0	0
Wigan, E. A. . . . .	Conholt Park, Andover . . . . .	1	0	0
Wilder, J. . . . .	Yield Hall Foundry, Reading . . . . .	1	1	0
Willcox, W. H. & Co. . . . .	36, Southwark Street, London,			
	S.E.1 . . . . .	1	0	0
Williams, D. D. . . . .	Live Stock Commissioner, Tre-			
	gaton . . . . .	1	1	0
Williams, G. L. . . . .	Chavenage, Tetbury . . . . .	1	1	0
Williams, Major Jestyn . . . . .	Miskin Manor, Pontyclun . . . . .	1	0	0
Williams, J. . . . .	Scorrier House, Scorrier, Cornwall	1	0	0
Williams, J. C., M.P. . . . .	Werrington Park, Launceston . . . . .	1	0	0
†Williams, M. Scott . . . . .	Woolland House, Blandford . . . . .			
Williams, O. . . . .	Crossways, Crosshill, Glam. . . . .	1	0	0
Williams, P. D. . . . .	Lanarth, St. Keverne . . . . .	1	1	0
†Williams, Col. Robert, M.P.	Bridehead, Dorchester . . . . .			
Willis, J. . . . .	Southwood, Evercreech . . . . .	1	0	0
Willis, J. Deane . . . . .	Bapton Manor, Codford, Wilts . . . . .	1	1	0
Wills, A. Stankly . . . . .	21, Royal Crescent, Bath . . . . .	1	0	0
*Wills, Capt A. S. . . . .	Thornby Hall, Thornby, North-			
	ampton . . . . .	2	0	0
Wills, Sir Frank . . . . .	Bristol . . . . .	1	0	0
Wills, G. A. . . . .	Burwalls, Leigh Woods, Bristol . . . . .	1	0	0
Wills, H. W. S. . . . .	15, Orchard Street, Bristol . . . . .	1	0	0
*Wills, W. D. & H. O. . . . .	Bedminster, Bristol . . . . .	2	0	0
Wills, W. . . . .	Marlwood, Thornbury, Glos. . . . .	1	0	0
Willson, Stephen . . . . .	Canadian Pig Powder Factory,			
	Peterborough . . . . .	1	0	0
Wilmot, S. M. . . . .	Albert Road, St. Philips, Bristol . . . . .	1	0	0

Name.	Residence.	Subscriptions.		
		£	s.	d.
Wilson, Dr. T. C. . .	Hull Manor Shire Stud Farm, Hinton Parva, Swindon . . .	1	1	0
Wiltshire Farmers (Ld.) . .	Chippenham . . . . .	1	0	0
Winter, Major F. J. . .	Canok Lodge, Walton-by-Clevedon, Somerset . . . . .	1	0	0
†Winterton, Earl, M.P. . .	. . . . .	..		
Withers, L. H. . . .	Manor Farm, Kimbridge, Romsey, Hants . . . . .	1	0	0
Withers, W. R. . . .	Lower Court Farm, Long Ashton, Bristol . . . . .	1	0	0
Woodcock, Major J., D.S.O.	Ashley, Stockbridge, Hants . . .	1	0	0
Woodhouse, Lt.-Col. S. H.	Heatherton, Taunton. . . . .	1	0	0
Worrall, W. H. . . .	Clyst St. Mary, Exeter . . . .	1	0	0
Wright, J. R. . . . .	Ades, Chailey, Sussex . . . .	1	1	0
Wyatt, A. C. . . . .	St. James' Street, St. James' Square, Bath . . . . .	1	0	0
Wyatt, J. . . . .	Mizzymead Farm, Nailsea, Bristol . . . . .	1	0	0
Wyatt, W. . . . .	Kingweston, Taunton . . . . .	1	0	0
Wyld, Col. C. E. . . .	Tile House, Denham, Bucks . . .	1	0	0
†Wynford, Lt.-Col. Lord, D.S.O. . . . .	Wynford House, Maiden Newton, Dorchester . . . . .	..		
Yeo Bros., Paull & Co. (Ltd.)	81, Victoria Street, Bristol . . .	1	0	0
Young, E. A. . . . .	Mangotsfield, Bristol. . . . .	1	0	0
Zacharias, J. & Co. . . .	Oxford . . . . .	1	0	0
Zambra, Capt. N., M.C. . .	Hattingley House, Medstead, Hants . . . . .	1	0	0
(19)				
Total . . . . .	1015			



# INDEX.

ACID SOILS IN ORCHARDS, 144  
 Acland, The Right Hon., F. D., on  
     Forest of Dean, 56  
 Aeration, Effect on root growth, 186  
 Agriculture, Ministry of, 21, 25  
 Alternative Generation, 38  
 Analyses, Cider, 96  
     — Members' Privileges of, ciii  
     — of Orchard Soils, 143, 146  
     — Selecting Samples for, cv  
 Annual Report upon the Society's Operations, 99  
 Aphides, As Gall causers, 46  
 Apple Bark Canker, 128  
     — Blossom Weevil, 130  
     — Tree Canker, 124  
 Arsenate of Lead for Spraying, 148  
 Attendance, Comparison of Show, 80  
 Autumn Pruning, 157  
 Awards, Salisbury Show, iii

BACTERIAL INFECTION OF PLUMS, 125  
 Barker, B. T. P., on the National Fruit  
     and Cider Institute, 104  
 Bastin, Harold. On Vegetable Galls, 30  
 Bath and West Society, Cheese and  
     Butter Schools, 17  
 Beans, Chocolate Spot of, 117  
 Big Bud, 49  
 Black Currants. Reversion of, 133  
 Bristol Meeting, cvii  
 Bulls, Value of recorded, 26  
 Butter Fat, Testing for, 29  
     — Test, Report on, 83

CABBAGE-ROOT FLY, 43  
 Cabbage, White, rust of, 53  
 Cattle Plague in 1866, 75  
 Chase Tractors, 64  
 Chemical Facilities, ciii  
 Cherries, Breeding varieties of, 140  
 Chlorosis in Soils, 120, 121  
 Chocolate Spot of Beans, 117  
 Cider Exhibition at Salisbury, E. W.  
     Farwell on, 95  
     — Orchards, Trial, 143  
 Climate and Fruit Tree Growth, 167  
 Colonial Land Tenure, 9  
 Competitions, Judges of, ii

Committees, Standing, 1920-1921, xcvi  
 Conditions and Regulations, Show,  
     cxliv  
 Council, Election of, xcii  
     — Members of, xcvi  
 Cox, Harold, on Local Taxation, 15  
 Crossing of Apple Varieties, 138  
 Cundall, H. M., on Nature Study Section, 93  
 Currant Blister, 46

DAIRY CATTLE, REGISTER OF, 25  
     — Demonstrations, 81  
     — Department, A. F. Somerville on,  
         80  
     — Herd Competition, 97  
 Disabled Soldiers, Work of, 95  
 Dominant Characters in Tomatoes, 142  
 Double Flowers, Galls and, 34

EELWORMS, GALLS CAUSED BY, 50, 51  
 English Timber, Uses of, 92  
 Enham Village Centre, 93, 95

FARMING, AS AFFECTED BY TRACTORS,  
     72  
 Farwell, E. W., on Cider Exhibition, 95  
 Feeding Stuffs, Guide to Purchase of,  
     civ  
     — — How to Sample, cv  
 Fertilisers, Guide to Purchase of, civ  
 Financial Statements, cxlvii  
 Finger and Toe Disease, 54  
 Food Supply, Royal Commission on, 3  
 Foot and Mouth Disease, 101, 102  
 Fordson and Oliver Tractor, 71  
 Forest of Dean, F. D. Acland on, 56  
     — —, Soil of, 56  
     — —, History of, 57  
     — —, Present Methods, 58  
 Forestry Section, Salisbury, G. Lipscomb, on, 90  
 Friesian Cows, Yield of, 28  
 Fruit Breeding, 138  
     — Bud Formation, 115, 151  
     — Preserving, 116  
     —, Peptic Substances of, 114  
 Fungi, Galls caused by, 52, et seq.

**Fungoid Pests on Conifers, 91**  
**Fungus Cytospora, 127**  
**Fungus Disease in Michaelmas Daisies, 129**

**GALL MIDGES, 41-43**  
**Galls, Causes of, 31**  
 —, Definition of, 30  
 —, Immunity from, 34  
 — Wasps, 31, 37  
**Garner, H. E., on Modern Tractors, 62**  
**George, Henry, on Progress and Poverty 6**  
**Glasgow Tractor, 64**  
**Gloucestershire Old Spot Pigs, 112**  
**Goats, Prizes and Judges, cxxiii**  
**Gooseberries, Crossing of varieties, 141**  
**Governing Body, Society's, xciv**  
**Growth Inhibition, 163**  
**Guest Flies on Galls, 39**

**HANDICRAFTS AT SALISBURY, 94**  
**Herd Books, Scheme for, 98**  
**Horses, Judges of, cix et seq.**  
 — Prizes for, cix et seq.

**JACKSON, HAROLD, ON MILK RECORD-  
 ING, 25**  
**Judges, List of, at Salisbury,**

**LACTOSE, RECOVERY OF, 21**  
**Land and the People, Sir Herbert  
 Matthews on, 1**  
 — Nationalisation Bill, 7, 8  
 — Nationalisation Society, 9  
 — Taxes, 10, 11  
**Laws, General, xci**  
**Lead Poisoning of Stock, 120**  
**Leaf Scorch, 115**  
 — Variation, Black Currants, 134  
**Lime Content of Soil, 120**  
 — Spraying against Weevils, 131  
**Lipscomb, G., on Forestry Section, 90**  
**Live Stock, Carriage to Shows, 101**  
 — —, Conditions and Regulations, cxxx  
**Loeb on Growth Inhibition, 163**  
**Logan Beetle, Spraying for, 148**  
**Lorette System of Pruning, 151**

**MATTHEWS, SIR HERBERT, ON THE LAND  
 AND THE PEOPLE, 1**  
**Members, List of, clxii**  
**Membership, Privileges, lxxxix**  
 — Terms of, xc

**Michaelmas Daisies, Disease of, 129**  
**Milk and Dairies Act, 24**  
 — Factories, 17 et seq.  
 —, Recovery of by-products, 20  
**Milking, Prizes for, cxxvii**  
**Milk, Putrefactive content of, 22**  
 — Recording, Harold Jackson on, 25  
 — —, Statistics of, 28  
 — —, Societies' Central Council, 29  
 — Test Classes, Salisbury, Dr. J. A. Voelker on, 85  
 — —, Tables of, 86-89  
**Mite-Galls, Signs of, 48**  
**Mites, As Gall causers, 47**  
**Motor Fuel, 70**

**NATIONAL FRUIT AND CIDER INSTITUTE,  
 B. T. P. BARKER ON, 104**  
 — Extension of, 107  
**Nationalisation of Land, 4, 5, 7**  
**Nature Study Section, Salisbury, H. M.  
 Cundall on, 93**  
**Nitre-bearing Shale, 122**

**OAK, GALLS ON, 38, 40**  
 — in Forest of Dean, 57  
**Officers, List of, xcvi**  
**Officials, Permanent, xcix**  
**Oyster Galls, 34**

**PEAR, BREEDING VARIETIES OF, 139**  
 — Midge, 42  
 — Mites, 49  
**Peptic Substances of Fruits, 114**  
**Peterboro' Tractor, 71**  
**Pickering, Spencer, on Planting Fruit  
 Trees, 177**  
**Pigs, Judges of, cxxv**  
 — Prizes for, cxxiv  
**Plums, Bacterial infection of, 125**  
**Potato, Wart Disease of, 54**  
**Poultry, Judges of, cxli**  
 —, Prizes for, cxli  
 — Regulations, cxliv  
**President, The, xciv**  
**Prizes and Awards, Salisbury, iii**  
**Produce Department, Dairy, 84**  
 — Judges of, cxxvi  
**Pruning as Affecting Fruit-buds, 151**  
 —, Commercial Practice in, 170

**RADIO-THORIUM MANURIAL VALUE OF,  
 121**  
**Raspberries, Crosses of Varieties, 141**

- Red Poll Cattle**, 88  
**Reversion of Black Currants**, 133 et seq.  
**Rivers Pollution Act**, 18  
 ———, Sources of, 19  
**Root Development of Newly Planted Trees**, 175  
**Root Formation in Sand**, 182  
 ——— in Water, 183  
 ——— System of Fruit Trees, 108  
  
**SALISBURY EXHIBITION, W. A. SMITH**  
 ON, 73  
**Sawflies**, 32, 36  
**Scale Insects**, Galls caused by, 47  
**Shale**, Nitre Content of, 122  
**Sheep**, Judges of, cxx  
 ———, Prizes for, cxx  
**Shoeing Prizes for**, cxxviii  
**Show Entries**, Comparison, 76  
**Silo Liquid**, Analysis, 202  
**Smith, W. A.**, on the Salisbury Exhibition, 73  
**Society**, Composition and Objects of the, xci  
**Soils**, Analyses of, 119 et seq.  
**Soil**, Instructions for Sampling, ciii  
**Somerville, A. F.**, on Waste from Milk Factories, 17  
 ———, on the Dairy Department, 80  
**Spraying for Apple Canker**, 125  
 ——— for Logan Beetle, 148  
**Spring Pruning**, 158  
**Spur Development in Fruit Trees**, 161  
 ——— System of Fruit Pruning, 153  
**State as Farmer**, 2, 4  
  
**Stationary Work by Tractors**, 71  
**Strawberries**, Crosses of Varieties, 143  
**Sulphur**, Fungicidal action of, 114  
  
**TAXATION, COMMITTEE ON LOCAL**, 11, 12  
**Test Department**, 82  
**Timber**, Conversion of British, 59  
**Tomatoes**, Cross Fertilisation of, 142  
**Tractors**, Garner on Modern, 62  
 ———, Improvement in Detail, 64  
 ———, Operation of, 66  
 ———, Trials, 67  
 ———, Types of, 63  
 ———, Wheels, 69  
**Trustees, Society's**, xciv  
**Turnip Seed Weevil**, 44  
  
**VARIETIES OF CIDERS, TESTS**, 195  
 ——— of Perries, Tests, 195  
**Vegetable Galls**, Harold Bastin on, 30  
**Vice-Presidents**, xciv  
**Voelcker, Dr. J. A.**, Annual Report, 199  
  
**WASTE FROM MILK FACTORIES, A. F. SOMERVILLE ON**, 17  
**Weevil in Apple Blossom**, 130  
**Wellingtonia Gigantea**, uses of, 92  
**Whey**, Disposal of, 19, 23  
**Wiltshire Elementary Schools**, 93  
**Winter Pruning**, 171  
**Woburn Fruit Farm**, Closing of, 106  
**Wood Shoots**, Pruning of, 159  
**Working Dairy**, 80

END OF VOL. XV.

BATH

PRINTED BY WILLIAM LEWIS &amp; SON, LTD, 12, NORTH GATE.

# BREEDERS' DIRECTORY.

## HORSES.

### Arab.

HOUGH, S. G., Springhouse Park, Theydon Bois, Essex. Stallions and Mares at Stud, including winners at the leading shows; also Polo Ponies at Stud and for sale.

### Cleveland Bays.

EDMUNDS, L., ESTATE OFFICE, CHOLDERTON, near Salisbury. Celebrated Stud established in 1890 by the late Mr. H. C. Stephens.

### Clydesdales.

CLYDESDALE HORSE SOCIETY OF GREAT BRITAIN AND IRELAND, 93, HOPE STREET, GLASGOW. ARCHD. MACNEILAGE, Secretary. Volume XLIII will be published early in 1921. Entries for Volume XLIV will close on September 30, 1921. Some previous Volumes of Stud Book on Sale, price 10s. each; half-price to Members.

GRAHAM, ROBERT, KAIMFLAT FARM, KELSO. Breeder and owner of high-class Clydesdales, Colts and Fillies, most fashionable blood. Large selection. Inspection invited. Station: Kelso, N.E. and N.B. Railways.

### Polo and Riding Ponies.

MASON, F. FITCH, THE FARAAM, KILLAY, GLAMORGANSHIRE. Breeder of prize-winning Welsh Mountain Ponies. Stallions: Grove Grey Dawn (893), Hawddgar Matchlight (732), Inspection invited. Apply, A. Cooke, Stud Groom.

MILLER, W. S., FOREST LODGE, BRECON, S. WALES. Extensive breeder of best class of Welsh Mountain Ponies, Cobs and Entirets.

TAYLOR, C. HOWARD, MIDDLEWOOD HALL, BARNSLEY. Good young Polo Ponies always for sale, bred from Mares which have been good players and prize-winners; also a few undersized Ponies suitable for India. Polo-bred Stallions: Field-Marshal, Favourite (sires of winners), and Complexion, all prize-winners and registered by Board of Agriculture as sound.

## HORSES—continued.

### Shires.

ASHBY FOLVILLE STUD (F.N.H. AND M. M. SMITH-CARINGTON). First-class Stallions for hire and service. Agent, W. Stallard, Worcester; Stud Groom, J. Sansby, Ashby Folville, Melton Mowbray, Leicestershire.

KEEVIL, CLEMENT, HORKESLEY HALL FARM, COLCHESTER. Breeder of Shire Horses of the best blood. Stallions for service and to let; Mares and Fillies for sale; also Breeder of Suffolk Sheep, Flock No. 506. Prefix and affix, Blagdon.

PEARSON, SIR EDWARD E., BRICKENDONBURY, HERTFORD. Stud horses: Dollas Empire (34701), Coleshill Forester (24149), Claydon Majestic (36419). Apply Estate Office, Brickendonbury, Hertford.

### Suffolks.

BLYFORD HALL STUD OF SUFFOLK PUNCHES. Typical Mares kept. Stallion for sale. Inspection invited. Apply, S. and H. Scrimgeour, Blyford Hall, Halesworth.

EDMUNDS, L., ESTATE OFFICE, CHOLDERTON, NEAR SALISBURY. Stud established 1895 by the late Mr. H. C. Stephens. The best strains and none but perfectly sound animals bred from Stallions, Mares and Fillies always for sale. Station: Grateley, L.&S.W.R. Telegrams: Cholderton.

### Thoroughbreds.

DICKINSON, GEORGE, CARK MILLS, CARK-IN-CARTMEL. Thoroughbreds, Hunters, Shires, all ages, thoroughly trained and unbroken. Best Yorkshire, Cumberland, Westmoreland and Lancashire blood. Nearly all prize-winning stock. 835 prizes won, including R.A.S.E., London, Royal Lancashire, Great Yorkshire, Altrincham, Wirral. Championships: London, North Lonsdale, Cartmel, Warrington, Ramsbottom, Southport, Windermere, Ormskirk, Westmoreland County, Royal of England and Royal Lancashire. Prices reasonable. Communications and inspection invited.

# BREEDERS' DIRECTORY.

## CATTLE.

### Aberdeen-Angus.

**ABERDEEN-ANGUS CATTLE.** The Premier Beef Breed. Illustrated pamphlets (various languages) recounting record of supremacy in beef production, on application. Secretary, Aberdeen-Angus Cattle Society, 137, Union Street, Aberdeen.

**CRIDLAN, J. J., MAISEMORE PARK, GLOUCESTER.** Stock Bull: Idyll of Maisemore (36219), First Prize winner and Reserve Champion R.A.S.E. 1915, George R. of Ballindalloch (30611). The Herd has won 216 First 141 Second Prizes, 30 Gold, 43 Silver Champion Medals, Smithfield Championships 1910, 1914, 1916, 1920, Reserve Championship, 1903 and 1915; final winner of King Edward VII's £105 Challenge Cup, 1914: awarded Championships, Norwich, 1907, 1910, 1911, 1912, 1915, Ipswich 1911, 1912, 1914, York 1912.

**SCOTT, C. T., Buckland Manor, Broadway, Worcestershire.** Stock Bulls: Etrurian of Bleaton, Champion, Royal and Highland Shows, 1919 and 1920; Proud George, First and Reserve Champion, Royal, 1919; Champion, Bath & West, 1920. Young Bull for sale. Apply, Day, Manager.

**THEAKSTON ABERDEEN-ANGUS HERD.** Founded 1883. 100 head registered Cattle. Yearling Bulls and Heifers for sale. Ballindalloch Sires. Owner J. McIntyre, Theakston, Bedale, Yorkshire.

### Ayrshires.

**AYRSHIRE CATTLE.** Reputed largest pedigree herd in England. Inquiries invited for Bull and Heifer Calves all closely related to winners in inspection classes at Royal, Highland, Ayr, Kilmarnock, and milk yield classes at Royal. Wm. Gibson, Carrick House, Ellesmere Park, Eccles, Lancs.

### British Friesians.

**CHILLINGWORTH, A. F. AND SONS, HIGHWORTH, WILTS.** Reddown British Friesians. Herd of 70 head. Bull calves and stock on sale by Wychnor YME (pure imported), and Reddown (imported) MURK, from heavy milking dams. Official Records.

## CATTLE—continued.

**HORACE HALE, Findon, Worthing, Sussex,** winner of first prize in South-Eastern Counties Dairy Herd Competition, over 100 entries of all dairy breeds competing. The whole herd, including twelve first-calf heifers, averaged over 1,000 gallon milk in 1919 and 1920. Stock Bull: Hedges Second Series (6427), P. I., whose seven nearest dams averaged 1,328 gallons milk in one lactation.

**HUGHES, JAMES E., LEA HALL, MOLLINGTON, NEAR CHESTER.** British Friesian cattle. Winner with bull, Bulkeley Klaske's Ceres of First Prize and Championship R.A.S.E., 1920; First Prize Chester, 1920; First Prize and Silver Medal, London Dairy Show, 1920.

**KNEBWORTH** herd of British Friesian Cattle, topnote for milk, size, type and fashionable breeding. We invite inspection.—Apply, W. and R. Wallace, Knebworth Station, Herts Station, Knebworth, G.N.R. (25 miles from King's Cross). Telephone: 34 Knebworth. Telegrams: Wallace, Knebworth Station.

**LANGLEY BRITISH FRIESIANS.** Best strains. High-class young Bulls usually for sale, by imported bulls; also three-quarter imported breeding. Official milk records. First prizes recently won in show ring. Stock Bull: Routh Dutchman (P.I.). Approved cows accepted. Preston Jones, Langley, Winchcombe, Glos.

**NEAME, FREDERICK, MACKNADE, FAVERSHAM, KENT.** Pedigree British Friesians. Herd established in 1889 with imported stock. Milk records kept for over thirty years. Cow's lactations completed in 1920 averaged 1,016 gallons.

**PEART, JAMES, LTD., Woodhall, Hatfield, Herts, Breeders, Ludwick Herds of Pedigree British Friesian Cattle, Berkshire and Wessex Pigs.** Telephone: Hatfield 75. Telegrams: Peart, Hatfield, Herts.

**WORDSWORTH, CHRISTOPHER, BROOKLANDS, SOUTH GODSTONE, SURREY.** British Friesian Cattle. Herd contains three fully imported animals. Several 1,000 gallon cows; official

## BREEDERS' DIRECTORY.

### CATTLE—*continued.*

records. Stock Bull: (Imported) Tredegar Wychnor Yme. Station: Godstone, S.E.R. Telegrams: South Godstone.

#### Guernseys.

**FERRAND, G. F.**, Morland Hall, Alton, Hampshire. Milk records carefully kept. Some of the best Island blood can be obtained here. Four different cows from this Herd have won the Senior Cow class in 1920 at the following Shows: E.G.C.S. Show, Devon County, R.A.S.E. and N.E. Hants.

**PEDIGREE HERD PRIZE-WINNING GUERNSEYS**, bred from Island strains. Bulls and Heifers for sale. Mrs. R. C. Bainbridge, Elfordleigh, Plympton, South Devon.

**SAYER, MAJOR, PLATNIX, WESTFIELD, SUSSEX.** Pedigree Guernsey Cattle. Good young Cows and Heifers for Sale. Telegrams: Westfield, Sussex. Station: Battle.

#### Herefords

**BIBBY, FRANK, HARDWICKE GRANGE, SHREWSBURY.** Prize-winning Herefords, male and female, always for sale and export. Also Scotch Shorthorns, finest strains. Apply, Bailiff, Hardwicke Grange, Home Farm, Hadnall, Shrewsbury.

**MASON, F. FITCH, THE FARAAM, KILLAY, GLAMORGAN.** Breeder and exhibitor of high-class Herefords. Eligible for all records.

**PYMAN, SYDNEY, PIGEON HOUSE, ROSSON-WYE, HEREFORDSHIRE.** Pedigree Hereford Cattle. Heifers and Bulls generally for sale.

**SHUCKNALL COURT HEREFORDS.** Owner, Henry Moore, Shucknall, Hereford. Breeder of many Royal and other show winners. Inspection cordially invited.

**WALKER, JOHN, KNIGHTWICK MANOR, WORCESTER.** Hereford Cattle. Prizes won at all the leading shows, 1920. Young Bulls and Heifers on sale eligible for all records.

#### Jerseys.

**COWDRAY PARK JERSEY HERD**, property of Major the Hon. Harold Pearson. Numerous prizes and

### CATTLE—*continued.*

awards in inspection, milk yield and butter test classes, including three champion prizes at the Royal Shows, 1919-1920. Well-bred young bulls, heifers and cows often for sale. No objection to tuberculin test. Address, The Agent, Cowdray Estate Office, Midhurst.

**HENDERSON, HON. LIEUT.-COL. H. G.**, Pedigree Jersey Herd. Apply, Walter Crosland, Estate Office, Buscot Park, Faringdon.

**WATSON-KENNEDY, MRS., WIVETON HALL, NORFOLK, HOLT STATION.** Pedigree Jerseys. Milk Records kept. All cows have passed tuberculin test. Bulls and cows for sale. Write, James Kemp, Herdsman.

#### Jerseys and Guernseys.

**FOWLER AND DE LA PERRELLE, PORTER'S LANE, SOUTHAMPTON**, the largest importers of Jerseys and Guernseys. Cows and heifers calving all the year round. Bulls of the best strains. No objection tuberculin test. Moderate prices. Shipping attended to. Telegrams:—"Importers, Southampton."

**HOUGH, S. G., SPRINGHOUSE PARK, THEYDON BOIS, ESSEX.** Government Milk Recorded Stock. Young Stock by late Stock Bull Bowlina's Lad 12853 by The Cid ex-Princess Bowlina, who won Goddington 1st Prize and Milk Yield 1st Prize, Jersey, 1919. Herd also includes prize winning cows.

**STEVENAGE JERSEYS.** Pedigree stock from prize-winning Milk and Butter Test strains. Milk records kept of each cow. Yearling Bulls and Heifers usually on sale. For particulars apply to Laurence E. Tubbs, The Priory, Stevenage, Herts.

#### Kerries and Dexters.

**BRAISHFIELD MANOR HERD OF DEXTER CATTLE.** Prizes won 1915 include championship R.A.S.E., Nottingham, first London Dairy Show. Apply, Mr. W. G. Owen, Elmgrove, Braishfield, Romsey.

**JOYCE, WALTER (REV.), CHARLES PARSONAGE, SOUTHMOLTON, DEVON.** Large Herd Pedigree Dexters. Bulls, Cows, Heifers, home-bred. Not dealer. Honours, Royal Showyard.

# BREEDERS' DIRECTORY.

## CATTLE—continued.

**PALMER, CAPTAIN RICHARD ELLIOTT**, The O.P.H. (Registered prefix). Oaklands Park Herd, Newdigate, Surrey, Pure pedigree Registered Kerry Cattle, prize-milking, butterfat, record strains, type, breeding. Apply The Foreman.

### Red Polls.

**BREDFIELD HOUSE HERD OF 50 PEDIGREE RED POLLS**. Property of J. H. Lachlan White, Esq. Heifers and Bulls bred from prize stock always for sale. Address, Bredfield House, Woodbridge, Suffolk.

**BROWN, THOMAS, & SON, MARHAM HALL, DOWNHAM, NORFOLK**. Herd established 64 years. Powell strains predominate. Large number of prizes won, including, in 1920, Male Championship for the second successive year and Reserve Female Championship at the R.A.S.E., both Male and Female and Reserve Female Championships Suffolk, and in addition eleven firsts and six other prizes at five summer shows. Daily milk records kept. Stock of all ages for sale.

**MUNNINGS, W. G., THE ROOKERY, WEYBREAD, HARLESTON, NORFOLK**. Mendham herd Red Polls bred for milk. Rendlesham, Gressenhall, Shotford blood. Average for mature cows in herd 9,103½ lb. Stock for sale.

### Shorthorns.

**ANNALY, LORD, HOLDENBY HOUSE, NORTHANTS**. Stock Bull used, Thornby Linksman. Prizes won 1920 2nd and Reserve Champion R.A.S.E. Show Darlington, 1st D.S.A. Prize Derbyshire Show. Reserve London Dairy Show. Station: Althorp Park. Telegrams: Holdenby.

**ASKE HERD PEDIGREE DAIRY SHORTHORNS** (the property of The Marquis of Zetland), consists of long pedigree families of a dual-purpose type, carefully selected and bred for milk and constitution. Daily milk records kept and inspected. Bulls for Sale. Apply, F. W. Hall, Olliver, Richmond, Yorkshire.

## CATTLE—continued.

**BARTON, BERTRAM H., STRAFFAN, CO., KILDARE, IRELAND**. Pedigree Shorthorns. Large old-established herd Cruickshank on Booth foundation. Prize-winners; good milkers; sound constitution.

**BRUNDRETT, WALTER, LACTON HALL, WILLESBOROUGH, KENT**. Pedigree Scotch Shorthorns chiefly of Bilsington blood. Kent or Romney Marsh Sheep, Flock No. 226; Large Black Pigs. Station: Ashford, S.E.C.Ry.

**BUNN, E. W., PEDIGREE DAIRY SHORTHORNS**. Daily milk records kept. Stock Bulls. Locking Dairyman 137600 (first prize Norfolk Show 1919), and Holdenby Chief Vol. 67, both full of 1,000 gallon prize-winning blood. The entire herd will be sold on June 7th, 1921. Particulars from owner, Church Farm, Drayton, Norwich.

**CHERRY, MATTHEW, LOMOND, MYROE, CO., DERRY, IRELAND**. Breeder of Scotch Shorthorn Cattle. The families in herd comprise: Violet, Laverder, Secret, Butterfly, Broadhooks, Augusta, Eliza, Golden Drop, Rosebud, Lady Dorothy, Charlotte Corday, Bessie, Ury Maid, Clara, Marigold, Maria, Matilda, Rosemary, Princess Royal and Orange Blossom. Stock Bulls: Scotch, Stamp, A Secret, bred at Uppermill, and Balcairn Boy, bred by F. L. Wallace, Esq.

**CHILLINGWORTH, A. F., & SONS, HIGHWORTH, WILTS**. Herd of 120 typical Dairy Shorthorns. Bull calves and stock excellently bred for milk for sale. Official records. Stock Bulls: Primrose Duke by Dreadnought, dam Primrose 3rd (dam of Elsie Foggathorpe); Kelmscott Freemason 61st by Cranford Freemason, dam Lovely 69th. Both sires 1,000 gallons milk each side.

**CHIVERS & SONS, LTD., HISTON, CAMBS**. Pedigree Dairy Shorthorn Herd, composed of Bates and other old English Families. Daily milk records checked by D.S.A., and Ministry of Agriculture Recorders. Bulls and Bull Calves for sale.

**EDGE, S. F., PEDIGREE SCOTCH SHORTHORNS**. Augusta, Broadhooks, Butterfly, Clippers, Lancasters, Missie. Constitution and good breeding,

## BREEDERS' DIRECTORY.

### CATTLE—*continued.*

powers encouraged by ample fresh air and exercise. Young Bulls and Heifers generally available for sale. Inspection welcomed. Gallops, Homestead, Ditchling, Sussex.

**GRAHAM-CLARKE, J. E. H., FROCESTER MANOR, GLOUCESTERSHIRE.** Scotch Shorthorn Cattle from Augusta, Miss Ramsden, Broadhooks, Charlotte Corday families. Young Bulls for sale.

**HENDERSON, HON. H. G., LT.-COL.** Pedigree Shorthorns of deep-milking strains. Bulls and Bull Calves for sale. Mr. Walter Crosland, Estate Office, Buscot Park, Faringdon.

**HOBBS, ROBERT W., & SONS, KELMSCOTT, LECHLADE, GLOS.** Herd of 500 Dairy Shorthorns; founded in 1877. One of the oldest and largest pedigree herds in existence. Milk, flesh, and constitution studied; daily Milk Records kept. Numerous prizes won for Inspection, Milking Trials, and Butter Tests. The Fifty Guinea Challenge Cup for the best group of Pedigree Dairy Shorthorns was won at Darlington last year for the fifth successive Royal Show. Bulls and Bull Calves on sale, with prices to suit all buyers. Four Cross Bull Calves at moderate prices, suitable for non-pedigree dairy herds, a speciality. All the cows in milk, and the bulls have passed the Tuberculin Test. Station: Kelmscott, 2 miles. Telegrams: Hobbs, Kelmscott.

**KIRK, THOMAS, ABBEY MAINS, HAN- DINGTON, EAST LOTHIAN.** Shorthorn Cattle. Many of the best Cruickshank families are represented in this Herd, viz.: Broadhooks, Princess Royals, Nonpareils, Butterflies, Goldies, Duchess, Clippers, Bessies, etc.

**LAW, MESSRS., MAINS OF SANQUHAR, FORRES.** Select Herd Scotch Shorthorns. Young Stock for sale. Herd always on view by appointment. Telegrams: Law, Sanquhar, Forres.

**LOUSLEY, EDWARD BURGFIELD, READING.** Pedigree and Non-Pedigree Dairy Shorthorns. Average yield, 1919-20, 8,382 lb. Cows, Bull Calves and Young stock for sale.

**MCWILLIAM, R. S., GARGUSTON, MUIR OF ORD, ROSS-SHIRE.** The Shorthorn Herd is composed of well-known

### CATTLE—*continued.*

Scotch strains, including the following: Augusta, Butterfly, Clipper, Sittyton Crocus, Goldie, Mysie, Rosebud, and Sittyton Violet. Bulls and Heifers generally for sale.

**ROBERTS, EDWARD A., WIRRAL MANOR HOUSE, CLATTERBRIDGE, BIRKEN- HEAD.** Dual-purpose Shorthorn Cattle, Coates' Herd Book. A few choice specimens at any time for disposal. Milk recorded. Station: Spital. Telegrams: Bebington.

**ROBINSON, J. AND H., IFORD, LEWES, SUSSEX.** Select herd of Pedigree Dairy Shorthorns; milk records kept. Best Bates blood. Young Bulls for sale, whose dams and sires' dams are heavy-milking cows with well-shaped udders and sound constitutions. Telegrams: Robinson, Iford, Lewes. Telephone: 114 Lewes.

**STRATTON, RICHARD, THE DUFFRYN' NEWPORT, MON.** Oldest-established Shorthorn herd in the kingdom, milk and flesh combined. Bulls and Heifers for sale.

**THORNTON, FRANK H., KINGSTHORPE HALL, NORTHAMPTON.** Pedigree Dairy Shorthorns. Winner of many prizes, including First Prize Milking Trials, Royal Show, 1911, and First Prize Heifer Milking Class and Breeders Silver Medal Dairy Show, 1915. Breeder of First and Champion Bull, Royal Show, 1919.

**WEIGALL, LT. COL. SIR. A. G., K.C.M.G., "PETWOOD," WOODHALL SPA, Lincs.** Pedigree Lincoln Red Shorthorns. Dual-purpose Cattle kept. Prizes won: Royal Lincs., County, Peterborough, Oakham, Boston, Alford, London Dairy Show and Smithfield. Apply, Agent, Estate Office. Station: Stixwold. Telegrams: Woodhall Spa.

**WELBECK HERD OF PEDIGREE SHORTHORNS,** the property of the Duke of Portland. Young Bulls and Heifers for sale from the best strains. Apply, Alex. Galbraith, Norton, Cuckney, Mansfield.

**WINKHURST HERD,** the property of A. H. L. Bohrmann, Esq., Winkhurst Green, Ide Hill, Sevenoaks, Kent.



## BREEDERS' DIRECTORY.

### CATTLE—continued.

Pedigree Shorthorns, dual-purpose type, long pedigrees only. Inspected milk-records. Nearest Station: Penhurst 2½ miles.

#### South Devons.

**ANTONY SOUTH DEVON HERD**, the property of Lieut.-General Sir Reginald Pole-Carew, K.C.B. Pedigree herd of deep-milking cattle, including cows of over 1,000 gallons. Daily milk records kept. Bulls, Cows, and Heifers for inspection and sale. Apply, C. G. C. Elers, Antony Estate Office, Torpoint, S.O., Cornwall.

**HANCOCK, CHARLES. THE MANOR FARM, COTHELSTONE, TAUNTON.** Herd of Devon Cattle. Telegrams and station: Bishop's Lydeard.

#### Welsh Black.

**LAIDLAW, D. G., HALE FARM, CHIDDINGSTONE, KENT.** Pedigree Welsh Black Cattle noted for rich quality of their milk and freedom from tuberculosis. Enquiries invited. Station: Penhurst. Telegrams: Laidlaw, Chiddingstone Causeway.

### SHEEP.

#### Cheviots.

**KIRK, THOMAS, ETTRICKHALL, SELKIRK.** 500 ft. above sea level. Registered flock of Cheviot Sheep. Rams sold annually at Lockerbie.

#### Dorset Horns.

**MERSON, FRANK J., AND SON, NORTH PETHERTON, BRIDGWATER.** Dorset Horn Rams and Ewes always for sale descended from Royal prize-winners.

#### Hampshire Downs.

**EDMUNDS L., ESTATE OFFICE, CHOLDERTON, NEAR SALISBURY.** The world famous flock founded in 1890, by the late Mr. H. C. Stephens. Sheep and Lambs for sale. Station: Grateley. L. & S.W.R. Telegrams: Cholderton.

#### Kent or Romney Marsh.

**DUNSTER, E. B., MONYPENNY HOUSE, NEAR RYE.** Established 1850. Registered Romneys. One of the oldest and best utility flocks in the Marsh. Ram Tegs sold annually in Rye since 1873. Typical Ewes always for sale.

### SHEEP—continued.

**FINN, ARTHUR WESTBROKE, LYDD, ROMNEY MARSH, KENT.** This flock grazed in Romney Marsh since 1740, has gained first prizes and (twice) reserve for champion Flock, in Ewe Flock competitions. 2,000 registered Sheep can be inspected at any time. Selections for sale.

**JENKIN, BERNARD, STOWING COURT, STOWING, HYTHE, KENT.** Pure-bred Kent or Romney Marsh Sheep Registered Flock, No. 187. Stock for sale. Station: Westenhangar. Telegrams: East Brabourne.

#### Lincoln Long-Wools.

**BROCKLEBANK, JOSEPH, CARLTON-LE-MORELAND, NEWARK.** Pure-bred Lincoln Longwool, Flock No. 10. Large number sold for export every year. Given satisfaction both at home and abroad. Inspection invited. Telegrams: Bassingham. Station: Navenby.

#### Oxford Downs.

**BRASSEY, CAPT. R. B., M.F.H., HEYTHORPE PARK, CHIPPING NORTON.** World renowned prize-winning flock of grand sheep, either sex, at moderate prices. On view at any time. Flock communications to S. Warner, Home Farm.

**HOBBS, ROBERT W., AND SONS, KELMSCOTT, LECLADE, GLOUCESTERSHIRE.** This Flock was established in 1863, and consists of from 1,000 to 1,250 registered Oxfords. Numerous prizes for many years won at the principal shows. Apply Ernest Hobbs, Little Faringdon, Leclade.

#### Ryeland.

**HOMES, W. J., GOLD HILL, BOSBURY, LEDBURY, HEREFORDSHIRE.** Breeder of pedigree Ryeland Sheep, winners of prizes. Flock established 40 years. Stock for sale. Rams used from leading flocks. Telegrams: Homes, Bosbury.

**RYELAND SHEEP, Clytha Park Flock,** winners of many prizes in previous years, including four First prizes Herefordshire and Worcestershire Show, 1916, and two First prizes, four Second prizes, and one for wool at Royal Show, Manchester, 1916; winners of First prize best pen five

## BREEDERS' DIRECTORY.

### **SHEEP—continued.**

Ewes at Hereford Ryeland Show and Sale, August 1918. Winners of several Prizes Royal Show, Cardiff, 1919. Awarded first Prize for best Ryeland Flock in United Kingdom, 1919. Shearling Rams and Ram Lambs, etc., for sale. Apply, Manager, Clytha Park, Abergavenny.

### **Shropshires.**

**BIBBY, FRANK, HARDWICKE GRANGE, SHREWSBURY.** Shropshire Sheep of choicest merit from celebrated prize-winning flock for sale and export. Also Berkshire Pigs. Apply, Bailiff, Hardwicke Grange, Home Farm, Hadnall, Shrewsbury.

### **PIGS.**

#### **Berkshires.**

**BRAISHFIELD MANOR HERD OF BERKSHIRE PIGS.** Bred from best recent prizewinning strains. Young Stock always for Sale. Apply Mr. W. G. Owen, Elm Grove, Braishfield, Romsey.

**MANUDEN HERD OF PEDIGREE BERKSHIRE'S. BOARS AND GILTS,** bred from prize-winners, for sale. Apply Gee, Manuden House, Essex.

**PEART, JAMES, LTD., WOODHALL, HATFIELD, HERTS.** Breeders, Ludwick Herds of Pedigree British Friesian Cattle, Berkshire and Wessex Pigs. Telephone : Hatfield 75. Telegrams : Peart, Hatfield, Herts.

#### **Gloucester Old Spots.**

**ALFASS, JOHN, BERKELEY, GLOS.** Gained Reserve at the Royal Show, Darlington, 1920. Correspondence invited.

**FAIRFIELD GLOUCESTER OLD SPOT HERD.** Prize-winning Boars and Dams, all ages, and many to select from. J. B. Dowding, Leominster.

**HOBBS, ROBERT W. AND SONS, KELMSCOTT, LECHLADE, GLOS.** Herd founded with the most reliable and fashionable strains. Dineford Lawless purchased for 200 guineas at six months at Capt. Hamilton's sale will follow Woodstock King, winner of second prize at the Royal Counties Show, Reading, 1920. Young Boars and Gilts on sale.

### **PIGS—continued.**

**THOMPSON, WALTER, FOSTON LODGE, FLAXTON, YORK.** Breeder Gloucester Old Spots Pigs. Gilslake Major, Bagborough and Lumberturn Strain. Boars and Gilts for sale. Stations: Barton Hill, or Flaxton, N.E.Ry.

#### **Large Blacks.**

**BLYFORD HALL HERD OF LARGE BLACK, PEDIGREE PIGS,** hardy and prolific, from best strains. Boars and Gilts for sale. Apply, S. and H. Scrimgeour, Blyford Hall, Halesworth.

**BURWELL HERD OF PEDIGREE LARGE BLACKS.** Hardy and prolific. Bred from record-price dams. Young Boars of the very best type for sale. F. E. Ball, Burwell, Cambs.

**BIXLEY HERD OF PEDIGREE LARGE BLACK PIGS.** For sale Boars all ages, well grown, hardy, and bred from noted winners. Apply Stanley A. Stimpson, Bixley, Norwich.

**DOUGLAS HERD OF PEDIGREE LARGE BLACK PIGS.** True to Type : Specially adapted for exports ; wonderful results in tropical and sub-tropical countries. Address Proprietor : Loudon MacQueen Douglas, 29, West Savile Terrace, Edinburgh.

**EDGE, S. F., VAHAN HERD PEDIGREE LARGE BLACKS.** Royal Champion and other show winners. Reared on open-air system on heavy weald clay. Out winter and summer, will thrive anywhere. Hundreds to choose from. Inspection invited. Gallops Homestead, Ditchling, Sussex.

**LARGE BLACK PIGS, PEDIGREE,** kept on grass. Boars and Gilts, prices reasonable. Pedigree Guernseys. White Turkeys, White Wyandottes sittings and stock birds. Currie, Mayfield, Sussex.

**PEARCE, E. W., THE CROSS ROADS, WHITTINGTON, LICHFIELD.** Large Black Pigs, Boars and Gilts, descended from Champion Royal winners, for sale. Prices reasonable. Stations : Lichfield City and Trent Valley, two miles.

**WEST WRATTING HERD OF PEDIGREE LARGE BLACK PIGS,** property of Edward P. Frost, Esq., West Wrattling Hall, Cambs. Boars and Gilts at reasonable prices ; best blood obtainable. Apply Fred P. Pitts, Farm Manager.

## BREEDERS' DIRECTORY.

### PIGS—*continued.*

**WIVETON HERD LARGE BLACK PIGS**, owned by Mrs. Watson-Kennedy. The highest price paid at auction for a Boar in 1920, 570 guineas, was bred in this Herd. Inspection invited. James Kemp, Wiveton Hall, Cley, Norfolk.

### Large Whites.

**CHIVERS & SONS, LTD., HISTON, CAMBS.** Over 1,000 pigs bred annually. Breeding Stock live out in Large Grass Orchards. Stock Boars include Histon Thor, Champion Peterborough and Suffolk 1920, Histon Lion Heart, Champion Royal Norfolk 1919, Dalmeny Macbeth, 1st Highland and Edinburgh 1920, and own brother to 720-guinea Sow. Young Stock always for Sale.

**COMMITTEE OF VISITORS, COUNTY ASYLUM, WINWICK, WARRINGTON.** Large White Pedigree Pigs. Railway stations: Warrington and Newton-le-Willows. Telegrams: Asylum, Winwick. Telephone No. 171, Warrington. All communications must be addressed, "The Steward," County Asylum, Winwick, Warrington.

**DALLEY, CLEMENT, CEDARS, KIDDERMINSTER.** Breeder of Pedigree Large White Pigs of finest type. Boars and Gilts for sale. Moderate prices.

**GREENALL, SIR GILBERT, BART., (V.O., WALTON HALL, WARRINGTON.** Walton and Worsley Herd Pedigree Large White Pigs. Since the purchase of the Worsley Herd from the late Earl of Ellesmere in 1913, Championships have been awarded at each Royal Show. Inspection and enquiries cordially invited. Apply to **RICHMOND DAYBELL, Manager, Rowswood Farm, Higher-Walton, Near Warrington.**

**KIRBY BEDON HERD PEDIGREE LARGE WHITE PIGS.** Grand young Boars and Gilts at moderate prices. Hardy constitution, size, and bone. W. Mitchell, The Vale, Kirby Bedon, Norwich.

**LONGNOR HERD OF PEDIGREE LARGE WHITE PIGS.** Foundation stock obtained only from leading Champion Herds and reared under an open air system. Boars and Gilts for sale. Major Corbett, Longnor Hall, Shrewsbury.

### PIGS—*continued.*

**MICKLEOVER HERD OF PEDIGREE LARGE WHITE PIGS**, property of A. Preston Jones, Mickleover House, near Derby. Boars and Gilts for sale. Piggeries: Slack Lane, Derby. Apply M. J. Verdon, Mickleover House, near Derby.

**RIDDELL HERD OF PEDIGREE LARGE WHITE PIGS:** reared in Scotland on the open-air system, summer and winter; Hardy fast growing stock, moderate prices. Major Sprot of Riddell, Lilliesleaf, Roxburgshire.

**STETCHWORTH HERD OF LARGE WHITE PIGS**, the property of the Earl of Ellesmere. Boars and Gilts of all ages at farmers' prices. Apply W. F. Gardner, Ellesmere Estate Offices, Worsley, or personally to Manager of Piggery, at Worsley, near Manchester.

**WINWICK HERD OF PEDIGREE LARGE WHITE PIGS.** The property of the Visiting Committee, County Asylum, Winwick, Warrington. Boars and Gilts for Sale. Communications to the Steward, County Asylum, Winwick, Warrington.

### Middle Whites.

**CHIVERS, JOHN, HISTON, CAMBS. PEDIGREE MIDDLE WHITE PIGS.** Breeding stock live out in Grass Orchards. Wins 1920 included Champion Boar, Champion Sow, and Cup for Best Middle White Pig, won outright (second year in succession), R.A.S.E. Show, Darlington. Young Stock for Sale.

**EDGE, S. F., ALBANY HERD PEDIGREE MIDDLE WHITES.** Herd started from Champion Strains. Bred on open-air system. Out winter and summer on Weald clay. Marvellous constitutions, wonderful doers and breeders. Hundreds to choose from. Gallops Homestead, Ditchling, Sussex.

**GRAY, C. HENRY, BREEDER MIDDLE WHITE AND LARGE BLACK PIGS.** Hill Crest registered Herd. Quality high; prices low. Lindsey Hall, Lindsey, Suffolk.

**PEENE HERD PEDIGREE MIDDLE WHITE PIGS.** A few grand Boars and Gilts fit for service for sale. Winners at Smithfield, Bath and West, Association Show, etc. Apply: Holland, Peene House, Newington, Folkestone.

# BREEDERS' DIRECTORY.

## PIGS—*continued.*

**PRESTWOOD HERD OF MIDDLE WHITE PIGS**, owned by W. B. Hill, Wednesfield, Wolverhampton. Boars and Gilts of choicest breeding from winners at principal shows always on sale. Of hardy constitution; kept out on grass; will thrive anywhere.

**THE SALVATION ARMY LAND COLONY PEDIGREE HERD OF MIDDLE WHITES**, bred from the best strains in the country. Careful selection made for buyers unable to make personal choice. Apply The Governor, Land Colony, Hadleigh, Essex.

**THE WHARFEDALE HERD OF PEDIGREE MIDDLE WHITE PIGS**. Royal Show record: Won Championship 1908, 1909, 1910, 1913, 1914, 1915, and 1919. Also First Prize for pen of three Gilts at eleven successive Shows. Well known characteristics of the Herd are true type and fine quality, combined with size and sound constitution. Prompt and careful attention to all enquiries and orders. Prices always reasonable. Apply, Leopold C. Paget, Middlethorpe Hall, York.

## Yorkshires.

**WHITE, ALFRED W., HILLEGOM, SPALDING**. Breeder of Pedigree Large White Pigs from best possible stocks. Winner of first and champion prizes at R.A.S.E. and other leading Shows. Inspection by appointment. Correspondence invited.

## Wessex.

**SIMS AND MORRISON, WOODSPRINGS, BROCKWEIR, NEAR CHEPSTOW**, have always on sale Pure-bred Wessex Saddlebacks. These Pigs are in natural condition, carry plenty of coat, and live out of doors. They are the true grazing pigs.

## POULTRY.

### Buff Orpingtons.

**DALTON HOLMES, MRS.**, Gold and Silver Medal Buff Orpingtons for Winter Eggs 10/6, 12/6, 15/6. Sitting also Snowden-Barron, White Wyandottes 12/6, all unfertiles replaced. East Markham Hall, Newark.

## POULTRY—*continued.*

### Dorkings.

**MAJOR, ARTHUR C.** Breeder and Exhibitor thirty years. Champion Dark and Silver Grey Dorkings, "England's best fowl." Prizes at all shows. Birds exported all over the world. Prices moderate. Arthur C. Major, Ditton, Langley, Bucks.

### Khaki-Campbell Ducks.

**CORBETT, MRS., LONGNOR HALL, SHREWSBURY.** Khaki-Campbell Ducks. Pettipher-Campbell, own strains. Stock Birds and Eggs. Hardy and wonderful layers.

### Turkeys.

**HARPER, GAGE, MASON'S BRIDGE, RAYDON, HADLEIGH, SUFFOLK.** Breeder, Exhibitor, and Exporter Mammoth Bronze Turkeys. Cock Turkeys always on sale. Price lists and testimonials on application. Inspection invited. Telegrams: Harper, Hadleigh, Suffolk.

### Various.

**COWLISHAW, BROS., M.S.P.B.A., OAK LODGE, LOUDWATER, BUCKS.** Breeders of high-class utility White Leghorns (Hanson's), White Wyandottes (Barron). All birds on approval. Sittings of Eggs and Day-old Chicks in season.

**HEARNshaw, ROGER FLETCHER, FOXHILL, BURTON JOYCE, NOTTS.** Breeder record pedigree laying White Wyandottes and White Leghorns. Also exhibition Black Rosecomb and Scotch Grey Bantams. Birds and Eggs for sale. Send for Price List.

## MISCELLANEOUS.

**MICKLEOVER PEDIGREE STUD FARM**, property of A. Preston Jones, Mickleover House, near Derby. Suffolk Horses, Lincoln Red Shorthorns, Suffolk Sheep, Large White Yorkshire Pigs. Apply, M. J. Verdon, Mickleover House, near Derby.

## AUCTIONEERS.

**FRANKLIN & GALE, AUCTIONEERS AND LIVE STOCK AGENTS, MARKET PLACE, WALLINGFORD, BERKS.** Periodical sales of Hampshire Down Rams. Stock Kees and Store Lambs, at Oxford Ram Fair and Ilsey Fairs and Markets.

## BREEDERS' DIRECTORY.

### AUCTIONEERS—*continued.*

**HALL, WATERIDGE & OWEN**, Agricultural and General Auctioneers, Land Agents, and Valuers, Smithfield sales. Offices at Shrewsbury, Wem, and Oswestry. Proprietors of the Raven Horse Repository, Shrewsbury, and Mid-Wales Horse Repository, Newtown, Mont. Head Office, Shrewsbury. Telephone : 45.

**LINCOLNSHIRE STOCK AUCTIONEERS AND AGENTS.** Dickinson, Riggall and Davy, Agricultural Auctioneers, Valuers, and Estate Agents. Specialities : Supervision of Estates, Sales of Properties, Lincoln Red Shorthorns, and Longwool Sheep. Markets and sales. Offices : Louth, Grimsby, and Brigg.

**LOYD & SONS, FRANK**, Auctioneers and Valuers, and Property Salesmen. North Wales Horse Repository, Wrexham, and Cheshire Horse Repository, Crewe. Cattle Markets : Wrexham, Crewe, Whitchurch, Ellesmere, Malpas, St. Asaph, Congleton. Property, Furniture and other sales. Valuations of all descriptions. Head Offices, Wrexham and Crewe. Branches : Whitchurch (Salop) Ellesmere (Salop).

**REEVE & FINN**, Stock Auctioneers, Valuers and Estate Agents, Rye, Sussex and Lydd, Kent. Annual Sales of Pedigree Kent and Romney Marsh Sheep and Rams in Ashford Market, Kent, and Rye Market, Sussex.

**RISDON & LEVERSHA, F.A.I., WIVELISCOMBE, WASHFORD, AND MINEHEAD, SOMERSET.** Official Auctioneers to the Devon Cattle Breeders' Society

### AUCTIONEERS—*continued.*

and the Exmoor Horn Sheep Breeders' Society (for Somerset). Large sales of Devon Cattle and Sheep at their Auction Marts at Wiveliscombe, Washford, and Williton and periodical sales at Raleighs Cross, Brendon Hill ; Kingsbrompton, and Winsford (Exmoor Sheep). Sales of Pedigree Devon Cattle at Taunton and Exeter in February and October. Full particulars of all sales on application. P.O. Telephone : No. 5 Wiveliscombe, No. 3 Washford.

**WALLET, WILLIAM**, LIVE STOCK AGENT, CASTLE-DOUGLAS, N.B., supplies on moderate commission all classes of Scotch Cattle and Sheep. Large consignments of pure-bred Galloway Cattle sent to England every year for establishing herds, and also for crossing with white bulls. Belted or Sheeted Cattle very picturesque. Grand Milkers, beautiful butter.

**WARD & CHOWEN, TAVISTOCK AND OKEHAMPTON, DEVONSHIRE.** Auctioneers, Surveyors and Land Agents. Auctions conducted in any part of the Country. Valuation and Sale of Landed Estates and Collection of Rents.

**WATERS & SON, AUCTIONEERS AND VALUERS, SALISBURY.** Office of Hampshire Down Sheep Breeders' Association. Treasurer : James E. Rawlence. Secretary : W. J. Wooff,

**WHITE & SONS (JAMES A. WHITE),** Auctioneers, Land and Timber Surveyors, Agricultural and General Valuers, Estate and Tithe Agents, 18, High Street, Dorking. Telephone 85, Dorking.

TRADE



MARK.

# **SPECIAL (COMPLETE) FERTILISERS**

---

**CONCENTRATED FERTILISER,  
GUANO COMPOUND,**  
(FOR ALL CROPS).

**MANGOLD, CORN, POTATO,  
TURNIP & GRASS FERTILISERS**  
(SPECIALLY PREPARED FOR THE SEVERAL CROPS).

---

We are also offering

**Pure Vitriolised Bone, Dissolved Bone Compound,  
Superphosphates and Potassic Superphosphate**  
of standard grades, in fine, friable condition.

---

**BASIC SLAG** (Anchor brand, our own grinding).

**BONE MEAL & STEAMED BONE FLOUR**  
(our own make).

**GRANULAR NITROLIM** (Ammonia & Lime Fertiliser).

**FRENCH KAINIT** (14% Potash) } FROM THE POTASH  
,, **SYLVINITE** (20% Potash) } MINES OF ALSACE.

---

For the above, or any other Fertilisers, apply to Agents, or to

THE

**Anglo-Continental Guano Works**

LIMITED,

**DOCK HOUSE, BILLITER ST., London, E.C.3.**

# John Unite, Ltd.,

291-293, Edgware Road, LONDON, W.2.

Factories—PADDINGTON GREEN.

Telegrams "UNITENT, EDGWARE, LONDON"

Telephone: PADDINGTON 5933 and 5934

MANUFACTURERS OF

**RICK CLOTHS, TARPAULINS,  
HORSE CLOTHING.**

**FLAGS, TENTS, MARQUEES.**

**OILSKIN CLOTHING**

AND

**GARAGE ACCESSORIES**

---

## WALTON & WORSLEY HERD

of Pedigree

### LARGE WHITE PIGS,

the property of Sir GILBERT GREENALL,  
Bart., C.V.O., Walton Hall, Warrington.

Awarded Championships at the last five  
Shows of the Royal Agricultural Society  
of England

Selections for Sale at moderate prices.

Apply to

**RICHMOND DAYBELL,**

HIGHER-WALTON, near WARRINGTON.

(Trains met by appointment).

---

## DUNNS FARM SEEDS,

LTD.,

*Agricultural Seed Specialists,*

DUNNSEED CHAMBERS,

SALISBURY.

—:O:—

Farm Plant Museum,

Farm Seed Cleaning Plant.

---

## WORMS IN LAMBS

Anthoid Tablets have been proved by thousands of farmers to be the very best remedy for treating lambs and sheep for

### STOMACH AND INTESTINAL WORMS.

Not only will they eradicate these parasites, but are an excellent tonic. Animals quickly improve after their use

Are quite easy to give Anthoid Tablets are prepared according to the improved compound arsenic formula of vet and makers They are now very extensively used at home and abroad

We could quote pages of orders and testimonials from customers who regularly use Anthoid Tablets. Avoid cheap and inferior imitations

Prices 100, 4s 6d, 500 22s 1,000, 42s, post free, for abroad 1s 6d extra per 1,000 for postage

Sole Makers and Proprietors—

**M. JAMES & CO.,**

Manufacturing Veterinary Chemists,

FITZHAMON WORKS, CARDIFF.

---

## STAPLEFORD PARK HERD OF

MIDDLE WHITE PIGS.

*Sired by Royal Prize Winners.*

A few choice Gilt and Boars always  
on Sale at Reasonable Prices.

C. S. HARVEY,

WYMONDHAM, OAKHAM.

WITH WHICH IS INCORPORATED

# **H. P. MOORE & SONS,**

## **Motor, Mechanical & Electrical Engineers,**

TELEGRAMS:—

**"SOS."** SALISBURY.  
ANDOVER.

TELEPHONES:—

HEAD OFFICE 392 } SALISBURY.  
SHOWROOMS 72 }  
ANDOVER BR. 54 } ANDOVER.

**A**

**SPECIALLY TRAINED STAFF**

IS AT YOUR **SERVICE** FOR REPAIRS TO ALL CLASSES OF

**FARM MACHINERY,  
TRACTORS, STATIONARY & PORTABLE ENGINES.  
ELECTRIC LIGHTING & POWER.**

**MAGNETO & DYNAMO REPAIRS.**

ARMATURES REWOUND—REMAGNETISING

IN OUR OWN WORKS,

**Not sent to London with consequent indefinite delays.**

**OXY-ACETYLENE AND ELECTRIC WELDING**

CARRIED OUT BY SPECIALISTS ON THE PREMISES.

**MACHINE WORK OF EVERY DESCRIPTION.**

ANY NEW PART MADE.

**AGENTS FOR THE PRODUCTS OF**

**Messrs. PETTERS, HORNSBY, CROSSLEY, LISTER.**

**LARGE STOCKS OF**

**OVERTIME & FORDSON TRACTOR PARTS**

ALWAYS AVAILABLE.

**SHOWROOMS:—**

60, CATHERINE ST., SALISBURY.

**ANDOVER BRANCH:—**

BRIDGE ST., ANDOVER.

**HEAD OFFICE & WORKS:—**

**SOUTHAMPTON ROAD, SALISBURY.**

# **SALISBURY & ANDOVER.**



**I. A. R. I. 75.**

IMPERIAL AGRICULTURAL RESEARCH  
INSTITUTE LIBRARY  
NEW DELHI.

[illegible]